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## BEFORE THE ARIZONA CORPORATION COMMISSION

CARL J. KUNASEK  
Chairman  
JIM IRVIN  
Commissioner  
WILLIAM A. MUNDELL  
Commissioner

Arizona Corporation Commission

DOCKETED

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IN THE MATTER OF U S WEST  
COMMUNICATIONS, INC.'S  
COMPLIANCE WITH §271 OF THE  
TELECOMMUNICATIONS ACT OF 1996

DOCKETED BY

DOCKET NO. T-00000A-97-0238

RESPONSE OF AT&T AND TCG-  
PHOENIX TO JUNE 8, 1999,  
PROCEDURAL ORDER QUESTIONS

On June 8, 1999, the Arizona Corporation Commission Hearing Division issued a procedural order listing 14 questions and asking that all parties in the above-captioned proceeding respond with answers by June 21, 1999.<sup>1</sup> These questions request input from the parties on the standards and procedure to be used in evaluating the Operational Support Systems ("OSS") used by U S WEST Communications, Inc.

AT&T Communications, Inc. and TCG-Phoenix (collectively, "AT&T") hereby respond to the questions posed in the June 8, 1999 procedural order.

1. **What are the current national standards for OSS?**

Several telecommunications industry organizations develop standards and guidelines to make transactions between telecommunications companies easier and more efficient. Adherence to these standards and guidelines is voluntary and address the most fundamental issues surrounding interface design (e.g., data fields, format, communications mechanisms). Individual companies can decide to comply with all or part of the standards and guidelines. However, the standards and guidelines do not resolve all interface design issues. For example, the application

standards and guidelines do not resolve all interface design issues. For example, the application of company-specific business rules necessary to successfully exchange information with the underlying ILEC legacy systems is not addressed by the industry standards and guidelines. Nevertheless, most major telecommunications carriers participate in standards setting organizations and agree to comply for the most part with the standards and guidelines established by the industry.

The primary telecommunications OSS standards setting organization is the Alliance for Telecommunications Industry Solutions ("ATIS"). ATIS seeks to resolve national and international telecommunications issues on a timely basis. There are over 500 companies that participate in ATIS, including AT&T and U S WEST. ATIS sponsors nine committees/forums to address specific telecommunications issues.

One of the sponsored forums is the Ordering and Billing Forum ("OBF"). The mission of the OBF is "[t]o provide a forum for customers and providers in the telecommunication industry to identify, discuss and resolve national issues which affect ordering, billing, provisioning and exchange of information about access service, other connectivity and related matters." The OBF is the standard setting organization for pre-ordering, ordering, provisioning and billing issues associated with local exchange competition.

There are presently seven standing OBF committees. These committees are:

- Billing ("BLG") Committee
- Directory Services Committee ("DSC")
- Ordering and Provisioning ("O&P") Committee
- Message Processing ("MSG") Committee
- Subscription ("SUB") Committee

- Telecommunications Services Ordering Request (“TOR”)
- SMS/800 Number Administration Committee (Not addressing local competition issues)

The following OBF committees are involved with pre-ordering, ordering, provisioning and billing processes:

Process	OBF Committee Involvement
Pre-order	O&P/TOR
Ordering/Provisioning	O&P/TOR/SUB/DSC
Billing	BLG/MSG

The OBF produces the Local Service Ordering Guidelines (“LSOG”) and the Local Service Request (“LSR”) form. The LSOG contains the generalized business process flows, interface guidelines and informational requirements to support the ordering of some of the items required for local exchange service. The LSOG also contains the LSR. The LSR is the standard ordering form for some of the items required for local exchange competition. The latest issue of the LSOG is version 4.0.

ATIS also sponsors the Telecommunications Industry Forum (“TCIF”). TCIF promotes electronic commerce, electronic data interchange, and electronic bonding. Two of TCIF’s committees are the Electronic Communications Implementation Committee (“ECIC”) and the Electronic Data Interchange (“EDI”) Committee. ECIC fosters the implementation of electronic communications to improve customer service. Its mission is to identify and resolve common technical and operational issues for the successful implementation of electronic bonding. ECIC focuses on the implementation of application-to-application communications for operations, administration, maintenance and provisioning (OAM&P) functions. It identifies additional

functionalities for standardization and champions the development with the appropriate standards groups.

The EDI committee is dedicated to the interpretation of established and future American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 standards and United Nations/Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT) Message applications in the telecommunications industry.

The EDI committee takes the standards developed by the OBF and provides interpretations of the OBF standards (e.g., LSOG) that are implementable through EDI systems. The latest version of the EDI standard is version 10.0. The ECIC suggests communications platforms to the OBF (e.g., TCP/IP, SSL3, and OSI) that are used in conjunction with EDI.

The Billing Committee of the OBF maintains responsibility for the Carrier Access Billing System ("CABS"), and Small Exchange Carrier Access Billing ("SECAB") documents. These are the documents that allow local exchange carriers to bill each other for usage and wholesale services. The latest version of the SECAB document is Issue 6. The latest version of the CABS document is 31.

The ATIS sponsored TIM1 subcommittee of the Committee T1 is responsible for maintenance and repair standards. ECIC is also responsible for taking maintenance and repair standards from TIM1 and translating them into electronic format. The maintenance and repair trouble reporting standards are contained in the T1.227 and T1.228 documents. The latest versions of those documents are ANSI T1.227a-1998 and ANSI T1.228-1995.

The standards established by all these preceding organizations often allow for liberal interpretation of the requirements because they are addressing national rather than company-specific issues. Consequently, while the national standards represent a good starting point, it

must be understood that even with national standards much work will need to be done to develop working interfaces between a CLEC and an ILEC. In many cases, for example, the industry standards are not sufficiently specific to serve as rules for implementing the standard for a particular transaction or legacy system. In these circumstances, the ILEC and CLECs must agree on many additional rules (e.g., new data elements may be added, conditional supply of data may be defined (if element A is provided then elements B, C, and D must be provided), company-specific validation requirements may be established, etc.) to supplement or supplant the industry standard. In other cases, an industry standard may designate important pieces of information or rules as optional rather than required. Here again, the ILEC and CLECs must agree on which of the optional rules the ILEC will accept or require so that a particular transaction can be effectively processed.

ILECs also frequently modify or add to the industry standards for their own benefit in order to minimize changes to the ILEC's existing legacy systems. In some cases, modifications are made to enhance the performance of those legacy systems for the ILEC without consideration of the impact upon the using party (i.e., the CLECs).

Consequently, two companies that want to exchange information pursuant to the standards must still have detailed and exacting business-to-business negotiations to fill in the details or requirements missing from the standards. Furthermore, because these interface requirements must adapt to changing business needs, it is absolutely critical that the parties have established and rigorously follow a change management process (as opposed to change control by one party).

2. **For areas in which no national standards exist, when are national standards anticipated?**

Telecommunications OSS standards setting should always be considered as “work in progress.” New issues are always being raised that member companies look to ATIS to resolve. Member companies also frequently seek to improve on functions and processes that have been previously addressed by ATIS. While the major OSS areas of pre-ordering, ordering and provisioning, maintenance and repair and billing are already being addressed by ATIS (and its various sponsored subcommittees), those areas may not cover all of the necessary functions. For example, in investigating and diagnosing a report of customer trouble, it is helpful for the repair representative to have access to a history of the customer’s previous troubles. This is called the trouble history. U S WEST provides its repair center representatives with the ability to request and retrieve a customer’s trouble history. While the ECIC standards include standards for trouble reporting, they do not include standards for retrieving a customer’s trouble history. Future versions of the ECIC standards will probably include procedures and standards for accessing and reviewing a customer’s trouble history.

Another example where industry standards are appropriate but are not yet promulgated relate to Advanced Data Services. More specifically, Power Spectrum Density masks are required to designate the permissible use of power within transmission frequencies for xDSL equipment. Likewise, spectrum management procedures are required to assure optimal operation of services and nondiscriminatory access to loop plant. Both these topics are being reviewed by the T1E1.4 committee. In addition, access to information essential to loop qualification for advanced services is being considered by the Network Interconnection Interoperability Forum (“NIIF”) sponsored by ATIS.

Incremental improvements and additions should be anticipated on a continuing and going forward basis. No standard will ever be deemed to be completely finished and all standards are possible candidates for review and/or improvement.

3. **What are the current FCC guidelines for OSS?**

The FCC guidelines are simple. The FCC stated that:

an incumbent LEC must provide nondiscriminatory access to their operations support systems functions for pre-ordering, ordering, provisioning, maintenance and repair, and billing available to the LEC itself. Such nondiscriminatory access necessarily includes access to the functionality of any internal gateway systems the incumbent employs in performing the above functions for its own customers. For example, to the extent that customer service representatives of the incumbent have access to available telephone numbers or service interval information during customer contacts, the incumbent must provide the same access to competing providers. Obviously, an incumbent that provisions network resources electronically does not discharge its obligation under section 251(c)(3) by offering competing providers access that involves human intervention, such as facsimile-based ordering.<sup>2</sup>

The FCC also requires ILECs to provide CLECs with OSS access that will permit CLECs to “perform the functions of pre-ordering, ordering, provisioning, maintenance and repair, and billing for network elements and resale services in substantially the same time and manner that an incumbent can for itself.”<sup>3</sup> In other words, the ILEC must provide CLECs with access to the ILEC’s OSS at parity with the access that the ILEC provides to itself.

The FCC has reinforced that standard in various Section 271 orders since the release of its *First Report and Order*. In the Ameritech Michigan Section 271 Order, the FCC summarized

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<sup>2</sup> *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-98, First Report and Order, FCC 96-325 (rel. Aug. 8, 1996) (emphasis added) (“First Report & Order”); ¶ 523. (footnotes omitted, emphasis added).

<sup>3</sup> First Report and Order, ¶ 518.

its requirements with respect to OSS when it stated, “[w]e require, simply, that the RBOC provide the same [OSS] access to competing carriers that it provides to itself.”<sup>4</sup> The FCC again pointed to the parity standard in the BellSouth South Carolina 271 Order,<sup>5</sup> the BellSouth Louisiana First 271 Order,<sup>6</sup> and the BellSouth Louisiana Second 271 Order.<sup>7</sup> Thus, the FCC is focused upon assuring that the outcome of the ILECs’ support of CLECs is nondiscriminatory rather than specifying the particular solution that will produce the desired outcome.

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<sup>4</sup>*Application of Ameritech Michigan Pursuant to Section 271 of the Communications Act of 1934, as amended, To Provide In-Region, InterLATA Services in Michigan*, CC Docket No. 97-137, Memorandum Opinion & Order (rel. Aug. 19, 1997), (“*Ameritech Michigan Order*”), ¶ 143.

<sup>5</sup>*Application of BellSouth Corporation Pursuant to Section 271 of the Communications Act of 1934, as amended, to Provide In-Region InterLATA Services in South Carolina*, CC Docket No. 97-208, (“*BellSouth South Carolina Order*”), ¶ 98 (“For those OSS functions that are analogous to OSS functions that a BOC provides to itself -- including pre-ordering, ordering and provisioning for resale services -- a BOC must offer access to competing carriers equivalent to the access the BOC provides itself.”)

<sup>6</sup>*Application of BellSouth Corporation Pursuant to Section 271 of the Communications Act of 1934, as amended, To Provide In-Region, InterLATA Services In Louisiana*, CC Docket No. 97-231, *Memorandum Opinion and Order*, (released Feb. 4, 1998) (“*BellSouth Louisiana First Order*”), ¶ 20. (“To ensure that all carriers are able to compete fairly for customers, the Commission has consistently emphasized that the incumbent LEC must give its competitors nondiscriminatory access to the functions of its operations support systems. More simply put, new entrants must be able to provide service to their customers at a level that matches the quality of the service provided by the incumbent LEC.”)

<sup>7</sup>FCC Memorandum Opinion and Order, *In the Matter of Application of BellSouth Corporation, BellSouth Telecommunications, Inc., and BellSouth Long Distance, Inc., for Provision of In-Region, InterLATA Services in Louisiana*, FCC 98-271, CC Docket 98-121 (October 13, 1998). (“*BellSouth Louisiana Second Order*”), ¶ 83. (“The Commission consistently has found that nondiscriminatory access to these systems, databases, and personnel is integral to the ability of competing carriers to enter the local exchange market and compete with the incumbent LEC. New entrants must be able to provide service to their customers at a quality level that matches the service provided by the incumbent LEC to compete effectively in the local exchange market.”)

As a result, the FCC has placed emphasis on both adequate performance measurement systems<sup>8</sup> (to monitor the operation of the OSS) and adequate back sliding provisions (to assure that, once demonstrably non-discriminatory OSS support is provided, the performance does not deteriorate). The FCC has drawn preliminary conclusions regarding model performance measures as discussed in its Performance Measurements NPRM.<sup>9</sup> Specifically, the FCC has stated that, “[w]e emphasize our belief that the adoption of model performance measurements and reporting requirements to serve as guidelines for state commissions constitutes the most efficient and effective role for the [FCC] in this area at this time.”<sup>10</sup> The FCC’s model performance measures, as augmented by input from CLECs in this state, will help the Commission determine if the OSS access that U S WEST provides to CLECs, regardless of the underlying technical architecture, allow the CLECs to perform necessary OSS functions at parity with U S WEST’s retail operations and the operation of U S WEST affiliates.

In its previous Section 271 Orders, the FCC has also established what constitutes “national guidelines” for various OSS functions. The FCC has commented extensively on such OSS functions as order flow-through, firm order confirmations (“FOC”), due date information and pre-order queries.<sup>11</sup> Virtually all of the specific guidelines relating to OSS functions that are

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<sup>8</sup> A performance measurement system is more than simply a set of areas to be monitored. It includes specifically defined and documented performance measurements that address all aspects of market entry and operational support; the mechanisms for data collection, calculation, result storage and retrieval; the processes for comparing and results to the applicable performance standard.

<sup>9</sup> *In the Matter of Performance Measurements and Reporting Requirements for Operational Support Systems, Interconnection, and Operator Services and Directory Assistance*, FCC Docket No. 98-56, Notice of Proposed Rulemaking (Released April 17, 1998), (“*Performance Measurements NPRM*”).

<sup>10</sup> *Performance Measurements NPRM*, ¶ 4.

<sup>11</sup> *Ameritech Michigan Order, BellSouth South Carolina Order, BellSouth Louisiana First Order and BellSouth Louisiana Second Order*.

found in the FCC's previous Section 271 Orders can also be found or are related to the model performance measures in the *Performance Measurements NPRM*.

4. **What are other standards this Commission should consider in evaluating whether U S WEST OSS complies with § 271?**

This Commission should also consider U S WEST's internal standards, practices, methods and procedures. In order to determine if U S WEST is providing CLECs with nondiscriminatory access to its OSS, the Commission must first understand the OSS access that U S WEST provides to itself. U S WEST's internal standards, practices, methods, and procedures will help provide insight into the OSS access that U S WEST provides to itself.

The Commission should also consider the service quality measurement standards developed by the Local Competition Users Group ("LCUG") and reported in the LCUG Service Quality Measurements ("SQM") Version 7.0 Document. A copy of that document is attached to this document as Attachment A. The LCUG document is quite similar to the performance measurements contained in the FCC's Performance Measurement's NPRM. However, the LCUG document is more detailed and provides additional explanations about why specific measures are needed.

5. **Has an OSS, or any portion of OSS, been approved by the FCC? If so, please provide specifics.**

No. The FCC has not approved an OSS or any portion of an OSS in any of its previous Section 271 orders.

6. **What type of collaborative process do you recommend to enable the parties to reach agreement on an acceptable OSS?**

AT&T recommends a collaborative process that will bring about independent, third party testing. AT&T's specific proposal for the third party testing process is contained in Attachment B to this document. AT&T has reviewed the Arizona Staff's Request for Proposal ("RFP") for Evaluation of U S WEST Communications, Inc.'s Operational Support Systems. It appears that the RFP did not contemplate a collaborative process with associated workshops. Consequently, AT&T's recommended process will be more comprehensive than the evaluation contemplated in the RFP. The RFP evaluation also, is not as comprehensive as those conducted in New York and Texas, nor is it as comprehensive as the third party testing proposed by CLEC coalitions in Florida or Georgia.

7. **What information is necessary to enable you to determine whether U S WEST's OSS is acceptable?**

Commercial usage that is monitored by a comprehensive performance measurement system is the best probative information. Performance results, if based upon a sound performance measurement system, can produce that facts that speak for themselves regarding whether or not U S WEST is meeting its obligation to provide non-discriminatory OSS support regardless of the mode of market entry chosen by a CLEC. The question that must ultimately be answered is whether the OSS access that U S WEST provides to CLECs is at least equal in quality to the access the U S WEST provides to itself or any affiliate of U S WEST.<sup>12</sup>

Performance results data will provide the factual, quantitative, objective evidence help answer

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<sup>12</sup> Where a directly analogous function is not evident -- and those instances should be rare -- the performance standard is that the OSS support must provide an efficient competitor with a meaningful opportunity to compete.

that question. However, there are several steps that must first be completed to ensure that any performance results data are reliable.

The first step is to develop clear, well-defined, and documented performance measurements. These performance measurements can be thought of as a ruler against which U S WEST's performance (for CLECs and itself) can be measured. AT&T believes that the measurements in the LCUG SQM 7.0 document are the measurements against which the Commission should gauge U S WEST performance.

The second step is to determine the criteria for success. When evaluating the performance that U S WEST provides to both CLECs and to itself, there needs to be an understanding of "how good is good enough"? AT&T recommends that statistical testing be used to determine if U S WEST is meeting its parity obligations. Specifically, AT&T recommends that a modified Z-statistic,<sup>13</sup> in conjunction with permutation analysis, be used to establish whether individual performance results (CLEC compared to U S WEST) fail to demonstrate parity at a preset confidence level. The modified Z-test (and the resulting statistic) considers the calculated result (the mean), the variability of the data, and the number of data points for U S WEST and the CLEC. The results of the calculation permit conclusions to be drawn regarding whether the performance delivered to a CLEC is at least equal to the performance delivered to U S WEST retail or affiliate operations.<sup>14</sup> The evaluation must go

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<sup>13</sup> The calculation of the modified Z-statistic is documented in Local Competition Users Group – Statistical Tests for Local Service Parity, February 6, 1998, Version 1.0. A copy of this document can be found as Attachment C to this filing. This methodology has been adopted by the Michigan Public Service Commission (Case No. U-11830, Order dated 5/27/99) and endorsed by the Texas Commission Staff (Project # 16251, Final Staff Performance Measurement Recommendations, dated 6/2/99).

<sup>14</sup> When comparison to analogous performance for U S WEST is not involved, that is an absolute performance expectation (or benchmark) is set, statistical comparative procedures are not required – any performance worse than the benchmark constitutes a performance failure on the part of U S WEST.

beyond just an examination of individual results. The following factors must be considered and success demonstrated in each area:

- Does the performance delivered for each result demonstrate stable and compliant performance?
- Does the overall performance delivered to each individual CLEC demonstrate non-discrimination?
- Does the support of the CLEC industry in aggregate demonstrate compliance with statutory obligations?

The third step is to audit the data collection, analysis and reporting processes that U S WEST will be using. U S WEST will be providing performance results data as evidence of its compliance with its Section 271 obligations. The Commission will make very important decisions based, in part, upon that data. Before using that data to make decisions, the processes used to produce that data must be audited. The following types of questions must be answered in advance of drawing conclusions about the results: Are the data collection, analysis, and reporting processes well documented, systematic, and repeatable? Do procedures exist for initially documenting and maintaining performance measurement documentation and do those procedures conform to reasonable levels of quality and quality control? Is data collection (including appropriate sampling) comprehensive, with appropriate data ultimately input for performance measurement calculations and any excluded data captured and stored with the reason for exclusion designated?

The Commission's decision on U S WEST's Section 271 compliance will only be as good as the data upon which it relies to make its decision. Because the pending evaluation of U S WEST's OSS performance will have pervasive and long-lasting impact on the development

of local competition and, therefore, the Arizona consumer, the Commission needs to take prudent steps to assure that it can rely on the performance data submitted by U S WEST.

The fourth step, if commercial usage does not exist, is to begin processing orders and other activities that are representative of what CLECs might require from U S WEST. Ideally, these orders should be a combination of test orders followed by actual CLEC commercial usage. In the earlier stages of evaluation, test orders that do not use live CLEC customers and third-party testing are an efficient means of surfacing problems with an ILEC's OSS interfaces without having to use real CLEC customers as "guinea pigs." Once the third-party testing has established that the interfaces operate as required, commercial usage can be used to verify that the interfaces can operate in the "real world" and that the interfaces can withstand the rigors of competitive volumes.

The fifth step is to ensure that there are self-executing enforcement mechanisms in place to make certain that once U S WEST is granted Section 271 relief it does not experience any backsliding in its performance to CLECs.

8. **Do you agree that formal discovery should remain in place during the workshop phase of OSS? Should the discovery process be modified, if so, how?**

The formal discovery process should remain in place for discovery that was served and not denied by the Hearing Officers prior to the suspension of the latest procedural schedule on June 4, 1999. Neither the intervenors nor U S WEST should be permitted to submit additional formal discovery requests, however, until formal discovery is reinstituted after the collaborative process is complete. Instead, AT&T suggests that an informal process be put in place during the collaborative process to allow intervenors an opportunity to obtain relevant information during the collaborative process because U S WEST is in sole control of information regarding its

operational support systems. Without some formal or informal process to obtain information to assist the collaborative process, U S WEST could prevent access, or permit access on a limited basis, on its terms, to information necessary for the collaborative process to be successful.

AT&T believes that an informal process will better serve the needs of the parties to obtain information quickly without unnecessary expense. AT&T would propose that intervenors be allowed to submit informal requests that are relevant to the collaborative process to U S WEST in writing. U S WEST would not be obligated to respond, but would be required to notify the company requesting the information that it did not believe some or all of the information is relevant to the collaborative process. Intervenors would be permitted orally to provide to the Hearing Officers the basis for the individual requests and ask that U S WEST be required to answer the requests.

After the collaborative process is concluded, it will be necessary to reinstitute the formal discovery process no later than the date on which U S WEST is required to file its updated testimony (see response to question 14).

The formal discovery process, once reinstituted, should remain in place throughout the remainder of the proceeding.

9. **What discovery items that had been incorporated into intervenors' testimony should be separated out and responded to by intervenors prior to the filing of testimony?**

Intervenors should not be subject to discovery by U S WEST until intervenors have filed their testimony. U S WEST was required to file a *prima facie* case at the time it filed its application. It is required to make its case, even if no party intervenes and opposes its application. By intervening in U S WEST's Section 271 proceeding, an intervenor should not be subject to discovery until the intervenor files testimony taking issue with U S WEST's case. Only then

should U S WEST be permitted to conduct relevant discovery on the issues raised by an intervenor in its testimony.

Permitting U S WEST to conduct discovery prior to the intervenors actually filing testimony will permit U S WEST to significantly burden parties that have simply intervened in the proceeding. If intervenors are subject to discovery simply because they intervened in a proceeding, CLECs may choose to withdraw from the proceeding rather than litigate the relevance of burdensome discovery. As a result, the record before the Commission would not be complete.

10. **How should the workshops be conducted to insure maximum results in assessing U S WEST's OSS? Who should participate? How many workshops do you anticipate being useful, and over what period of time?**

The key to any successful workshops and any subsequent third party testing is the amount of cooperation that U S WEST is willing to provide. As an initial matter, a series of successful workshops requires active U S WEST participation and sufficient U S WEST resources devoted to the task.

The actual workshops will produce areas of disagreement between the parties. Many of these disagreements will hold up progress on other issues. A second key to successful workshops, therefore, is for the Commission to play a role in quickly resolving these areas of disagreement as they are identified so as to keep the process moving.

All of the parties to the current proceeding should be allowed to participate in the workshops. The number of workshops and the time for the workshops will be a function of the cooperation that U S WEST provides and the readiness of U S WEST's OSS interfaces. If U S WEST provides full cooperation and its OSS interfaces are truly providing nondiscriminatory access, then the workshops can be completed in a few months. However, if

U S WEST is uncooperative or, as was the case in the New York collaborative, U S WEST's interfaces are not truly operationally ready, then it could take over a year to complete the evaluation.

11. **Should a Staff Report issue with recommendations regarding existing OSS compliance and modifications to achieve compliance? How long after the last workshop will Staff need to issue a Report?**

Yes. Staff should issue a full, complete and detailed report with recommendations regarding the status of U S WEST's OSS, the level of compliance with the FCC's orders and rules, if any, and all modifications necessary to achieve compliance with those orders and rules.

12. **How much time after issuance of a Staff Report will you need to respond to the Report?**

The Request for Proposal released by the Staff requires the contractor hired to evaluate U S WEST's OSS to provide work product in the form of written testimony. This testimony can serve as the Staff Report if the testimony provides recommendations regarding the status of U S WEST's OSS, the level of compliance with the FCC's orders and rules, if any, and all modifications necessary to achieve compliance. It is recommended that all parties have a minimum of 3½ weeks to file testimony in response to the contractor's test.

13. **When will the intervenors and Staff be able to file a preliminary statement indicating whether U S WEST is in compliance with any checklist items?**

AT&T could provide its preliminary position regarding U S WEST's compliance with checklist items 30 days after U S WEST has both provided adequate responses to the initial discovery submitted to U S WEST by all parties and complied with the Hearing Officers'

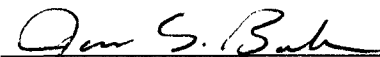
discovery rulings. Any position expressed by AT&T would be subject to change based on new or additional information received by AT&T or changes in positions by U S WEST.

14. **Any other relevant information that the parties desire to provide.**

If the Commission adopts a collaborative process, U S WEST's initial filing will become stale before there is any opportunity for the Commission to consider U S WEST's compliance with Section 271. Even U S WEST has acknowledged that "testimony can quickly become stale or even outdated." U S WEST Communications, Inc.'s Motion for Immediate Implementation of Procedural Order dated February 8, 1999, at 3. U S WEST filed its initial affidavits on March 25, 1999. Assuming for the sake of argument that the Commission implements a Procedural Order on July 13, 1999, that provides for hearings in December 1999, intervenors would be responding to testimony that is six to seven months old. Therefore, after the collaborative process is complete, U S WEST should be required to refile its case or, at a minimum, file supplemental testimony to update its initial filing. Intervenors should then be permitted sufficient time to conduct discovery prior to the filing of their rebuttal testimony.

RESPECTFULLY SUBMITTED this 22nd day of June 1999.

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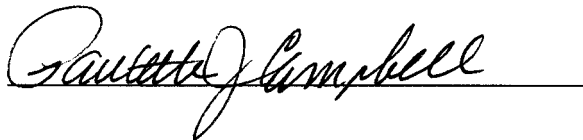
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A handwritten signature in cursive script, reading "Patricia Campbell", is written over a horizontal line.

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# **LOCAL COMPETITION USERS GROUP (LCUG)**

## **SERVICE QUALITY MEASUREMENTS (SQMs)**

August 28, 1998  
Membership: AT&T, Sprint, MCI, LCI,  
WorldCom

Version 7.0

# Service Quality Measurements

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# Service Quality Measurements

## Background

### **Background:**

On August 8, 1996, the Federal Communications Commission released its First Report and Order (the Order) in CC Docket No. 96-98 (Implementation of the Local Competition Provisions of the Telecommunications Act of 1996). The Order establishes regulations to implement the requirements of the Telecommunications Act of 1996. Those regulations are intended to enable potential competitive local exchange carriers (CLECs) to enter and compete in the local telecommunications markets. One requirement found to be “absolutely necessary” and “essential” to successful entry is that the incumbent local exchange carriers (ILECs) provide nondiscriminatory access to their operations support systems (OSSs). Many variations of interim OSS GUIs (graphic user interfaces) and electronic gateways have been or are being offered by the ILECs. These interim systems have not provided the capability for the CLECs to provide the same customer experience for their customers as compared to what the ILECs do for their customers. The availability, timeliness and accuracy of information processed by the ILEC for pre-ordering, ordering, provisioning, maintenance and repair, unbundled elements, and billing have not, to date, been satisfactory. Service delivery problems exist regardless of whether total service resale (TSR), unbundled elements, or interconnection are utilized. Final solutions for application-to-application real time system interfaces are elusive because of the complexity, the diversity of committed implementation schedules, and lack of or inconsistent use of industry guidelines.

On February 12, 1997, the Local Competition Users Group (LCUG) issued its “Foundation For Local Competition: Operations Support Systems Requirements For Network Platform and Total Services Resale.” The core principles contained in the document are: Service Parity, Performance Measurement, Electronic Interfaces, Systems Integrity, Notification of Change, and Standards Adherence. Each of these is significant to ensure CLEC customers can receive at least equal levels of service compared to those the ILEC provides to its own customers.

The LCUG group indicated in its Foundation document that it was essential that a plan be developed to measure the ILECs performance for all the OSS categories (e.g. pre-ordering, ordering and provisioning, maintenance and repair, network performance, unbundled elements, operator services and directory assistance, system performance, service center availability and billing). To that end, an LCUG subcommittee was formed with a charter to address measurements and metrics. The subcommittee jointly developed a comprehensive list of potential measurements, which was shared among the team members for review. Each committee member researched an assigned measurement group for the purpose of proposing consolidation and other modifications. The subcommittee discussed each measurement and considered existing regulatory requirements (minimum service standards) as well as good business practices in arriving at the recommended measurement and extent of detail to be reported. Service Quality Measurement (SQM) benchmark levels of performance were established to provide a nondiscrimination standard in the absence of directly comparative ILEC results. Establishing precise benchmark levels was difficult since ILECs have been reluctant to share actual performance results. The benchmarks, therefore, were based upon best of class performance and an assessment of the necessary performance to support a meaningful opportunity for CLECs to compete. SQM benchmarks may change if the ILECs share historical and/or self-report current results.

### **Measurement Plans:**

A measurement plan, capable of monitoring for discriminatory behavior, must incorporate at least the following characteristics: 1) it permits direct comparisons of the CLEC and CLEC industry experience to that of the ILEC through recognized statistical procedures; 2) it accounts for potential performance variations due to differences in service and activity mix; 3) it measures not only retail services but experiences with UNEs and OSS interfaces; and 4) it produces results which demonstrate that nondiscriminatory access to OSS functionality is being delivered across all interfaces and a broad range of

# Service Quality Measurements

## Background

resold services, unbundled elements and interconnection capabilities. The measures employed must address availability, timeliness of execution, and accuracy of execution.

It is essential that the CLECs be able to determine that they are receiving at least equal treatment to that ILECs provide to their own retail operations or their local service affiliates. Benchmarks (performance standards) that are either negotiated by the CLECs and ILECs, or ordered by Commissions, need to clearly demonstrate that new service providers are receiving service on reasonable terms that affords an efficient CLEC a meaningful opportunity to compete.

This document discusses measurements at both a summary level (Executive Overview) and at a level suitable for starting the implementation process (Measurement Detail).

# Service Quality Measurements

## Business Rules

### Business Rules

#### Test for Parity and Compliance with the Act:

Across all reporting dimensions, performance results (mean, proportion, or rate) should be collected for the ILEC's retail versus wholesale performance. Using a statistical model acceptable to CLECs, these results should be compared to confirm or reject an assumption of parity (in performance results and variance) for each dimension.<sup>1</sup> These individual parity comparisons should result in a monthly determination of the ILEC's compliance with its section 251 nondiscrimination obligations. The ILEC's record of compliance over some period of time will be used as one element in making a determination of compliance with section 271.<sup>2</sup>

#### ILEC Results Are Not Reported Or Results Are Incomplete:

The mean, proportion or rate result for CLEC must be compared and a determination made that the CLEC result is no worse than the benchmark performance level. The benchmark performance level to be used in the comparison is the result produced via special study by an ILEC (as described below) or, in the absence of such a study result, either the LCUG default performance benchmarks or other applicable state standards as may be determined by the appropriate regulatory agency.

#### Benchmarking Study Requirements:

The ILEC should produce a study supporting a benchmark performance level whenever a reasonable ILEC retail analog does not exist. When the ILEC performs a benchmarking study, it must be based upon equivalent experiences of that ILEC and conform to the following minimum requirements: (1) a benchmark result is provided for each reporting dimension described for the measurement; (2) the mean, standard error, and number of sample points are disclosed for each benchmark result; (3) the study process and benchmark are fully disclosed and independently audited; (4) update to the benchmark result will occur whenever changes may reasonably be expected to affect the study results and reviewed every six months for changes in the business climate that could significantly affect the benchmark. Unless directly ordered by the appropriate regulatory commission, no ILEC benchmark should be utilized without the mutual agreement of the CLECs impacted by the use of the benchmark.

#### Reporting Expectations and Report Format:

CLEC results for the report month are to be shown in comparison to the ILEC retail result for the same period with an indication, for each measurement, where the CLEC result is lesser in quality compared to the ILEC (based upon the test for parity described in the preceding). Such detailed results should be reported only to the CLEC unless written permission is provided to do otherwise. Furthermore, reporting to the individual CLECs should include, for each measure, a representation of the dispersion around the average (mean) of the measured results for the reporting period (e.g. percent of 1-4 lines installed in the 1<sup>st</sup> day, 2<sup>nd</sup> day, 3<sup>rd</sup> day, and > 10 days, etc.) In summary, the ILEC should also report separately on its performance for each reporting dimension as provided to: (1) its own retail customers, (2) any of its affiliates that provide local service, (3) competing carriers (CLECs) in the aggregate, and (4) the individual CLEC receiving the report. The "affiliate" category above includes any ILEC affiliate that purchases local service for resale or purchases unbundled network elements from the ILEC. Performance results of the ILEC and ILEC affiliates would be provided to CLECs as proprietary information that could be used for legitimate business purposes other than marketing-type activities.

#### Delivery of Reports and Data:

Reports should be made available to CLECs preferably by the 5<sup>th</sup> day following the close of the calendar report month or on an alternative schedule, which may be mutually agreed to between

<sup>1</sup> The details of this statistical model used to accept or reject an assumption of parity are found in LCUG's "Statistical Tests For Local Service Parity v1.0" white paper.

<sup>2</sup> The details of the methodology utilized to make a monthly 251 compliance determination as well as the requirements for 271 compliance are found in LCUG's "Local Service Non-Discrimination Compliance and Compliance Enforcement v1.0" white paper.

# Service Quality Measurements

## Business Rules

CLECs and the ILEC. If requested by the CLEC, data files of raw data supporting the performance reports are to be transmitted by the ILEC to the CLEC on the 5th scheduled business day pursuant to mutually acceptable format, protocol and transmission media. Likewise, individual CLEC reports should be considered proprietary and competitively sensitive. As such, no CLEC should receive information about another CLEC (other than a CLEC affiliate of an ILEC).

### **Disaggregation:**

Performance measurements reporting should be disaggregated to ensure parity comparisons are meaningful. The reporting dimensions in Appendix A provide LCUG's recommended disaggregation level for each Performance Measurement. The appropriate disaggregation across all ILECs should be comparable to the requirements in Appendix A. However, LCUG recognizes that the ILECs current method of operation may be unique and thus require modifying the disaggregation to be ILEC specific. The mutually agreed disaggregation must be consistent with the overall requirement of ensuring meaningful parity comparisons that do not obscure actual performance result differences.

Measurement data should be reported in a manner consistent with natural geographic and operational areas that allow prudent operational management decisions to be made and that do not obscure actual performance levels. Currently, ILECs report at levels as discrete as individual exchanges (Central Offices) and as aggregated as the ILEC Region.

Reporting at too high a level of geographic aggregation, for example, statewide (except for a LEC that may serve only a limited portion of a state) or LATA-wide (in states where LATAs encompass large geographic areas) can mask underlying differences in performance so as to make meaningful parity determinations unlikely. For example, if local competition exists only in one metropolitan area of a state, statewide measurement and reporting could obscure that an ILEC is providing significantly superior performance to its own metropolitan retail customers because of its below-average performance in non-competitive parts of the state.

Although an ILEC may claim that it cannot disaggregate below statewide/LATA reporting levels, it knows its performance in various regions within a state so that it can evaluate its operation and performance personnel, and allocation of resources within these smaller geographic units.

ILECs that currently report (whether externally or internally) performance in geographic units smaller than a state or LATA should continue to use those units. For ILECs that have not established such subdivisions, MSAs (metropolitan statistical areas) may be an appropriate level of geographic disaggregation.

Further, performance interval results are often affected by the volume of service requested by the CLEC. For instance, a request for 30 or more telephone numbers or an order for 100 lines will likely lead to a longer performance interval than a request for a single phone number or a single line installation. Hence, it is critical that interval-affecting volumes be reported separately to accurately depict ILEC performance in handling both the smaller and larger volume requests. The volume thresholds should be mutually agreed to by ILECs and CLECs and disaggregated sufficiently to allow a meaningful comparison of an ILEC's retail versus wholesale performance (e.g. Mean Completion Interval for 1-10 lines, 10-30 lines and greater than 30 lines).

### **Verification and Auditing:**

By request of one or more CLECs, an audit of data collecting, computing and reporting processes—as well as related business processes—must be permitted by the ILEC. The ILEC also must permit an individual CLEC to audit or examine its own results pursuant to terms no more restrictive than those established between the CLEC and the ILEC in their interconnection agreement for the relevant operating area.

# Service Quality Measurements

## Business Rules

During implementation of the measurement reporting, the validation of data collection, measurement result computation and report production will be necessary. The ILEC must permit such validation activities. It may not subsequently contend that such activities constitute an audit under the terms of the measurement plan or the CLEC's interconnection agreement.

### **Adaptation:**

Technology, market conditions and industry guidelines/standards continue to evolve. LCUG reserves the right to modify the content of this document as necessary to reflect such changes.

# Service Quality Measurements

## Executive Overview

### **Executive Overview:**

- Summarizes the business implications of each measurement function
- Quickly lists each measurement and its reporting dimensions

# Service Quality Measurements

## Executive Overview

### Ordering and Provisioning (OP)

Function:	
Order Completion Intervals	
Business Implications:	
<ul style="list-style-type: none"> <li>When the CLEC commits to a due date for service delivery, the customer plans for service availability at that time and will be dissatisfied if the requested service or feature is not delivered when promised.</li> <li>The “average completion interval” metric monitors the time required by the ILEC to deliver integrated and operable service components requested by a CLEC, regardless of whether total service resale or unbundled network elements are employed.</li> <li>When the service delivery interval of the ILEC is measured for comparable services, then conclusion can be drawn regarding whether or not CLECs have a reasonable opportunity to compete for customers.</li> <li>The “average completion interval” and “percent completed on time” also may prove useful in detecting developing network capacity problems.</li> <li>The “average offered interval” shows whether the ILEC offers less favorable timeframes for completions to CLECs than to itself or affiliates. This measure also can be compared to the “mean completion interval” to note disparities in timeframes CLECs are offered but are later changed by the ILEC.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Average Completion Interval</li> <li>% Orders Completed on Time</li> <li>Average Offered Interval</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Service Type</li> <li>Order Activity Type</li> <li>Geographic Scope</li> <li>Volume Category</li> </ul>

Function:	
Order Processing Quality	
Business Implications:	
<ul style="list-style-type: none"> <li>Customers expect that their service provider will deliver precisely the service ordered and all the features specified.</li> <li>The “order accuracy” measurement monitors the accuracy of the provisioning work performed by the ILEC in response to CLEC orders.</li> <li>Measuring the percent of mechanized order flow through is critical to reducing errors and inefficiency caused by ILEC rekeying CLEC orders on behalf of customers.</li> <li>Measurements of order rejections and resubmissions can highlight problems with ILEC systems or training processes unduly affecting the CLEC.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>% Order Accuracy</li> <li>% Mechanized Order Flow Through</li> <li>% Order Rejections</li> <li>Average Submissions Per Order</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Interface Type</li> <li>Service Type</li> <li>Order Activity Type</li> <li>Volume Category</li> </ul>

# Service Quality Measurements

## Executive Overview

Function:	
Order Status	
Business Implications:	
<ul style="list-style-type: none"> <li>When customers call their service provider, they expect to be able to promptly get information regarding the progress on their orders.</li> <li>When changes must be made, such as to the expected delivery date, customers expect that they will be immediately notified so that they may modify their own plans.</li> <li>The order status measurements, when compared to the ILEC result, will indicate whether the CLEC has timely access to all the information needed to notify its customers promptly when changes and rescheduling are required.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Reject Interval</li> <li>FOC Interval</li> <li>Jeopardy Interval</li> <li>Completion Notice Interval</li> <li>% Completions/Attempts Without Notice or With Notice Less Than 24 Hours</li> <li>% Jeopardies</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Interface Type</li> <li>Service Type</li> <li>Order Activity</li> <li>Geographic Scope</li> </ul>

Function:	
Coordinated Cutovers	
Business Implications:	
<ul style="list-style-type: none"> <li>Customers must not be subjected to unscheduled service disruptions because of lengthy or uncoordinated cutovers of loops with interim or permanent number portability.</li> <li>Customers have suffered loss of dialtone due to the early cutover of trunks with interim number portability. Late ILNP facilities conversions and PNP conversions of translations by ILECs also can cause unscheduled disruptions in service.</li> <li>The “coordinated cutover” measurements capture the extent to which CLEC customers face more losses in dialtone or call blocking due to mishandling of such cutovers.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Average Coordinated Conversion Interval</li> <li>% Service Loss from Early Cuts</li> <li>% Service Loss from Late Cuts</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Service Types</li> <li>Order Activity</li> <li>Geographic Scope</li> <li>Volume Category</li> </ul>

Function:	
Held Orders	
Business Implications:	
<ul style="list-style-type: none"> <li>Customers expect that work will be completed when promised.</li> <li>There must be assurances that the average period that CLEC orders are held, due to a delayed completion, is no longer for CLEC than ILEC orders.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Held Order Interval</li> <li>% Orders Held <math>\geq</math> 90 Days</li> <li>% Orders Held <math>\geq</math> 15 Days</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Service Type</li> <li>Reason for Hold (no facilities, no equipment, workload, other)</li> <li>Geographic Scope</li> </ul>

# Service Quality Measurements

## Executive Overview

### Maintenance and Repair (MR)

Function:	
Time To Restore	
Business Implications:	
<ul style="list-style-type: none"> <li>Customers expect prompt restoral of service to the normal operating parameters whenever troubles are detected.</li> <li>The longer the time required to correct a service problem, the greater the customer dissatisfaction</li> <li>Failure to provide parity in jeopardy notices regarding maintenance appointments can cause customers great inconvenience, particularly for delivery of service through collocations and UNEs when massive coordination of vendors, technicians, translations specialists and other technicians are involved. Customers will not tolerate a provider that cannot at least notify them when a maintenance or trouble handling appointment cannot be met.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Time to Restore</li> <li>Average Jeopardy Notice Interval for Maintenance Appointments/Trouble Handling</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Service Type</li> <li>Trouble Type</li> <li>Geographic Scope</li> </ul>

Function:	
Frequency of Repeat Troubles	
Business Implications:	
<ul style="list-style-type: none"> <li>This measurement, when gathered for both the ILEC and CLEC, can establish whether or not CLECs are competitively disadvantaged (vis-à-vis the ILEC) as a result of experiencing more frequent occurrences of customer troubles not being resolved on the first repair attempt. Differences in this measure may indicate that the CLEC is receiving inferior maintenance support in the initial resolution of troubles or, in the alternative, it may indicate that the network components supplied are of inferior quality.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Repeat Trouble Rate</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Service Type</li> <li>Trouble Type</li> <li>Geographic Scope</li> </ul>

# Service Quality Measurements

## Executive Overview

<b>Function:</b>	
<b>Frequency of Troubles</b>	
<b>Business Implications:</b>	
<ul style="list-style-type: none"> <li>Customers demand high quality service from their supplier, and differentials in supplier performance are quickly recognized throughout the market place.</li> <li>When measured for both the ILEC and CLEC and compared, this metric shows whether CLECs are competitively disadvantaged, compared to ILECs, as a result of experiencing more frequent incidents of trouble reports.</li> <li>Disparity in this measure may indicate differences in the underlying quality of the network components supplied.</li> </ul>	
<b>Measurements:</b>	<b>Results Detail:</b>
<ul style="list-style-type: none"> <li>Trouble Rate</li> <li>% Troubles in 30 Days of New Installations and Other Order Activity</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Geographic Scope</li> <li>Service Type</li> <li>Trouble Type</li> </ul>

<b>Function:</b>	
<b>Estimated Time To Restore Met</b>	
<b>Business Implications:</b>	
<ul style="list-style-type: none"> <li>When customers experience trouble on working services, they naturally expect the services to be restored within the time frame promised.</li> <li>When this measure is collected for the ILEC and CLEC and then compared, it can be used to establish that CLECs are receiving equally reliable (as compared to the ILEC operations) estimates of the time required to complete repairs.</li> </ul>	
<b>Measurements:</b>	<b>Results Detail:</b>
<ul style="list-style-type: none"> <li>% Customer Troubles Resolved Within Estimate</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Service Type</li> <li>Trouble Type</li> <li>Geographic Scope</li> </ul>

# Service Quality Measurements

## Executive Overview

### General (GE)

Function:	
<b>Systems Availability</b>	
Business Implications:	
<ul style="list-style-type: none"> <li>Dependable access to essential business functionality, supported by OSS of the ILEC, is absolutely essential to CLEC operations.</li> <li>This measure monitors whether such OSS functionality is at least as accessible by the CLEC as by the ILEC.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>% System Availability</li> </ul>	<ul style="list-style-type: none"> <li>By Function Interface</li> <li>Company</li> <li>Business Period</li> </ul>

Function:	
<b>Center Responsiveness</b>	
Business Implications:	
<ul style="list-style-type: none"> <li>When CLECs experience operational problems dealing with ILEC processes or interfaces, prompt support by the ILEC is required in order to ensure that CLEC customers are not adversely impacted</li> <li>Any delay in responding to CLEC center requests for support (e.g., request for a vanity telephone number) will, in turn, adversely impact the CLEC retail customer who may be holding on-line with the CLEC customer service agent.</li> <li>This measure monitors whether the ILEC's handling of support calls from CLECs is at least as responsive as the ILEC's handling of calls from its retail customers seeking assistance (e.g., calling the business office of the ILEC or calling the ILEC to report service repair issues).</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Mean Time to Answer Calls</li> <li>Call Abandonment Rate</li> </ul>	<ul style="list-style-type: none"> <li>By Support Center Provided</li> </ul>

Function:	
<b>Average Response Interval for Real-Time OSS Queries</b>	
Business Implications:	
<ul style="list-style-type: none"> <li>The CLEC customer service agent must determine the availability of desired features, likely service delivery intervals, telephone number(s) to be assigned and the validity of the street address information while the customer (or potential customer) is on the line.</li> <li>It is critical that the CLEC employees be perceived as equally competent, knowledgeable and fast as ILEC customer service agents.</li> <li>This measure is designed to monitor the time required for CLECs to obtain the pre-ordering information necessary to establish and modify service and maintenance information necessary to handle trouble resolution activities.</li> <li>Comparison to the ILEC results allow conclusions regarding whether CLECs have an equal opportunity to deliver a comparable customer service experience when a retail customer calls with a service inquiry.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Average Response Interval for OSS Query Information</li> </ul>	<ul style="list-style-type: none"> <li>Query Type (Pre-Ordering and Maintenance)</li> <li>Interface Type for Each Functional Area</li> </ul>

# Service Quality Measurements

## Executive Overview

### Billing (BI)

Function:	
Timeliness Of Billing Record Delivery	
Business Implications:	
<ul style="list-style-type: none"> <li>Regardless whether the billing is for retail customer or exchange access service, the timing of ILEC delivery of billing records must provide CLECs with the opportunity to deliver timely bills in as timely a manner as the ILEC; otherwise artificial competitive advantage would be realized by the ILEC.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Mean Time to Provide Recorded Usage Records</li> <li>Mean Time to Deliver Invoices</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Type of Record (end user or access) or Invoice (resale, UNE or interconnection services)</li> </ul>

Function:	
Accuracy of Billing Records	
Business Implications:	
<ul style="list-style-type: none"> <li>The accuracy of billing records affects the accuracy of the billing ultimately delivered to local service customers, whether retail local service or exchange access service customers.</li> <li>Billing for the elements from which CLEC services are constructed must be validated to assure that only correct charges are paid.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>% Invoice Accuracy</li> <li>% Usage Accuracy</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Type of Record (end user or access) or Invoice (resale, UNE or interconnection services)</li> </ul>

# Service Quality Measurements

## Executive Overview

### Operator Services/Directory Assistance & Listings (OS, DA & DL)

Function:	
Speed To Answer	
Business Implications:	
<ul style="list-style-type: none"><li>• The speed of answer delivered to CLEC retail customers, when the ILEC provides Operator Services or Directory Services on behalf of the CLEC, must be no slower than the speed of answer that the ILEC delivers to its own retail customers of equivalent local services.</li><li>• CLECs need adequate time to review the accuracy of directory listings before publication. The opportunity to check for errors should be available at parity with that afforded the ILEC or its affiliates regardless of whether manual or electronic interfaces are available.</li></ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"><li>• Mean Time to Answer</li><li>• Average Time Provided To Proof Updated Listings Prior to Publication</li></ul>	<ul style="list-style-type: none"><li>• Company</li><li>• Operator Services by Center</li><li>• Directory Service by Center</li><li>• Directory Listings by Directory</li></ul> <p>Note: OS/DA Speed to Answer is to be CLEC-specific if technically feasible.</p>

# Service Quality Measurements

## Executive Overview

### Network Performance (NP)

Function:	
Network Performance	
Business Implications:	
<ul style="list-style-type: none"><li>• The perceived quality of CLEC retail services, particularly when either ILEC services are resold or UNE combinations are employed, will be heavily influenced by the underlying quality of the ILEC network performance.</li><li>• Customers experience the quality of the service provider each time services are used.</li></ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"><li>• % Call Completion (Inbound and Outbound)</li><li>• Mean time to notify CLEC of a Network Incident/Outage</li><li>• Transmission Quality</li></ul>	<ul style="list-style-type: none"><li>• Trunk Type</li><li>• Switch</li><li>• Company</li><li>• Geographic Scope</li><li>• Reportable Incident</li></ul>

# Service Quality Measurements

## Executive Overview

### Collocation Provisioning (CP)

Function:	
Timeliness of Collocation Provisioning	
Business Implications:	
<ul style="list-style-type: none"> <li>Timely responses about the availability and price of collocation space or alternatives where space is not available or high priced is critical for CLEC financial planning on expansions beyond the calling areas of its switches.</li> <li>Timely provisioning of collocation arrangements enables CLECs to keep to business plans for entering new service areas.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Mean Time To Respond to Collocation Request</li> <li>Mean Time To Provide Collocation Arrangement</li> <li>% Due Dates Missed</li> </ul>	<ul style="list-style-type: none"> <li>Company</li> <li>Collocation Type</li> <li>Geographic Scope</li> </ul>

# Service Quality Measurements

## Executive Overview

### Database Updates (DU)

Function:	
Database Update Timelines and Accuracy	
Business Implications	
<ul style="list-style-type: none"><li>Timely and accurate database updates are critical to customers receiving prompt emergency assistance at correct locations when they dial 911; customers and friends obtaining correct dialing information from operators or telephone directories; and callers seeking correct information about acceptance of collect or third-party-billed calls.</li><li>Timely and accurate loading of CLECs' NXXs enable proper completion and billing of all calls, on-time launch of new facilities-based service, and proper emergency routing of calls for emergency assistance.</li></ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"><li>Average Update Interval</li><li>% Update Accuracy</li></ul>	<ul style="list-style-type: none"><li>Company</li><li>Database Type</li></ul>

# Service Quality Measurements

## Executive Overview

### Interconnect / Unbundled Elements and Combos (IUE)

Function:	
Availability of Network Elements	
Business Implications:	
<ul style="list-style-type: none"> <li>Because CLECs use individual elements as well as element combinations to deliver unique services, it is essential that the UNE functionality operate properly due to the crucial role played by such elements in providing quality retail services.</li> <li>This measure monitors individual network element or element combinations, that do not have an apparent retail analog, to assure that CLECs have a meaningful opportunity to compete through access to and use of an element (or combinations) functionality.</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Function Availability</li> </ul>	<ul style="list-style-type: none"> <li>By Unique UNE or UNE Combination Requested by CLEC</li> </ul>

Function:	
Performance of Network Elements	
Business Implications:	
<ul style="list-style-type: none"> <li>As CLECs use individual elements (as well as element combinations) to deliver unique services, it is essential that the UNE functionality operates in a timely manner because of the crucial role played by such elements in providing quality retail services</li> </ul>	
Measurements:	Results Detail:
<ul style="list-style-type: none"> <li>Timeliness of Element Performance</li> </ul>	<ul style="list-style-type: none"> <li>By Unique UNE or UNE Combination employed (e.g. LIDB Query time out)</li> </ul>

# Service Quality Measurements

## Formula Quick Reference

### Formula Quick Reference Guide

Measurement Designation:	Measurement Name:	Measurement Formula:
<b>Ordering and Provisioning (OP)</b>		
<b>OP-1</b>	<b>Average Completion Interval</b>	Average Completion Interval = $\Sigma [ (\text{Completion Date \& Time}) - (\text{Order Submission Date \& Time}) ] / (\text{Count of Orders Completed in Reporting Period})$
<b>OP-2</b>	<b>% Orders Completed on Time</b>	% Orders Completed on Time = $(\text{Count of Orders Completed within ILEC Committed Due Date}) / (\text{Count of Orders Completed in Reporting Period}) \times 100$
<b>OP-3</b>	<b>Average Offered Interval</b>	Average Offered Interval = $\Sigma [ (\text{Committed Due Date \& Time}) - (\text{Date \& Time of Receipt of valid Service Request}) ] / (\text{Number of Committed Due Dates})$
<b>OP-4</b>	<b>% Order Accuracy</b>	% Order Accuracy = $(\Sigma \text{Orders Completed w/o Error}) / (\Sigma \text{Orders Completed}) \times 100$
<b>OP-5</b>	<b>% Mechanized Order Flow Through</b>	% Mechanized Order Flow Through = $[(\text{Total Number of Orders Processed Without Manual Intervention}) / (\text{Total Number of Orders Completed})] \times 100$
<b>OP-6</b>	<b>% Orders Rejected</b>	% Orders Rejected = $[\text{Number of Orders Rejected Due to Error or Omission} / \text{Number of Orders Received by ILEC During Reporting Period}] \times 100$
<b>OP-7</b>	<b>Average Submissions Per Order</b>	Average Submissions Per Order = $\Sigma [ (\text{Number of Firm Order Confirmations}) + (\text{Number of Rejections Issued}) ] / (\text{Number of Firm Order Confirmations})$
<b>OP-8</b>	<b>Reject Interval</b>	Reject Interval = $\Sigma [ (\text{Date and Time of Order Rejection}) - (\text{Date and Time of Order Receipt or Acknowledgment}) ] / (\text{Number of Orders Rejected in Reporting Period})$
<b>OP-9</b>	<b>FOC Interval</b>	FOC Interval = $\Sigma [ (\text{Date and Time of Firm Order Confirmation}) - (\text{Date and Time of Order Acknowledgment}) ] / (\text{Number of Orders Confirmed in Reporting Period})$
<b>OP-10</b>	<b>Jeopardy Interval</b>	Jeopardy Interval = $\Sigma [ (\text{Date and Time of Committed Due Date for the Order}) - (\text{Date and Time of Jeopardy Notice}) ] / (\text{Number of Orders Jeopardized in Reporting Period})$ . For all orders jeopardized on or before the scheduled due date.
<b>OP-11</b>	<b>Completion Notice Interval</b>	Completion Notice Interval = $\Sigma [ (\text{Date and Time of Notice of Completion Issued to the CLEC}) - (\text{Date and Time of Work Completion by ILEC}) ] / (\text{Number of Orders Completed in Reporting Period})$
<b>OP-12</b>	<b>% Completions/Attempts without Notice or with Less Than 24 Hours Notice.</b>	% Completions/Attempts without Notice or with Less Than 24 Hours Notice = $[\text{Completion Dispatches (Successful and Unsuccessful) With No FOC or FOC Received Within 24 Hours of Due Date} / \text{All Completions}] \times 100$

## Service Quality Measurements

### Formula Quick Reference

Measurement Designation:	Measurement Name:	Measurement Formula:
OP-13	% Jeopardies	% Jeopardies = (Number of Orders Jeopardized in Reporting Period)/(Number of Orders Confirmed in Reporting Period)
OP-14	Average Coordinated Conversion Interval	Average Coordinated Conversion Interval = $\Sigma [(Date \& Time Re-termination is Completed by ILEC) - Date and Time of Initial Service Interruption (disconnect of facilities and translations for customer transferring service)/All Customer Conversions Completed During Reporting Period]$ x 100
OP-15	% Service Loss from Early Cuts	% Service Loss from Early Cuts = (Customer Conversion Where Cutover Time is Earlier Than Due Date and Time)/(All Customer Conversions Completed During Reporting Period) x 100
OP-16	% Service Loss from Late Cuts	% Service Loss from Late Cuts = (Customer Conversion Where Cutover Time Is More Than 30 Minutes Past Due Date and Time)/All Customer Conversion Completed During Reporting Period) x 100
OP-17	Held Order Interval	Held Order Interval = $\Sigma (Reporting Period Close Date - Committed Order Due Date) / (Number of Orders Pending and Past The Committed Due Date)$ for all orders pending and past the committed due date
OP-18	% Orders Held $\geq$ 90 Days	% Orders Held $\geq$ 90 Days = (# of Orders Held for $\geq$ 90 days) / (Total # of Orders Pending But Not Completed) x 100
OP-19	% Orders Held $\geq$ 15 Days	% Orders Held $\geq$ 15 Days = (# of Orders Held for $\geq$ 15 days) / (Total # of Orders Pending But Not Completed) x 100
<b>Maintenance and Repair (MR)</b>		
MR-1	Mean Time to Restore	Mean Time To Restore = $\Sigma [(Date and Time of Trouble Ticket Resolution Returned to CLEC)-(Date and Time Trouble Ticket Referred to ILEC)] / (Count of Trouble Tickets Resolved in Reporting Period)$
MR-2	Mean Jeopardy Interval for Maintenance and Trouble Handling	Mean Jeopardy Interval for Maintenance and Trouble Handling = $\Sigma [(Date and Time of Committed Due Date for Maintenance or Trouble Handling) - (Date and Time of Jeopardy Notice)] / (Number of Maintenance or Trouble Handling Appointments Jeopardized in Reporting Period)$
MR-3	Repeat Trouble Rate	Repeat Trouble Rate = (Count of Trouble Reports Where More Than One Trouble Report Was Logged for the Same Service Access Line Within a Continuous 30 Day Period) / (Number of Reports in the Report Period) x 100
MR-4	Trouble Rate	Trouble Rate = (Count of Initial & Repeated Trouble Reports in the Current Period) / (Number of Service Access Line in Service at End of the Report Period) x 100

## Service Quality Measurements

### Formula Quick Reference

Measurement Designation:	Measurement Name:	Measurement Formula:
<b>MR-5</b>	<b>% Troubles Within 30 Days of Install and Other Order Activity</b>	% Troubles Within 30 Days of Install and Other Order Activity = (Total Number of Trouble Tickets Associated With Lines That Had Service Order Activity Within 30 Days of the Trouble Report)/(Total Number of Orders Completed in the Report Period)
<b>MR-6</b>	<b>% Customer Troubles Resolved Within Estimate</b>	% Customer Troubles Resolved Within Estimate = (Count of Customer Troubles Resolved By The Quoted Resolution Time and Date) / (Count of Customer Troubles Tickets Closed) x 100
<b>General (GE)</b>		
<b>GE-1</b>	<b>% System Availability</b>	% System Availability = [(Hours Functionality is Available to CLECs During Report Period) / (Number of Hours Functionality was Scheduled to be Available During the Period)] x 100
<b>GE-2</b>	<b>Mean Time to Answer Calls</b>	Mean Time to Answer Calls = $\Sigma$ [(Date and Time of Call Answer) - (Date and Time of Call Receipt)] / (Total Calls Answered by Center)
<b>GE-3</b>	<b>Call Abandonment Rate</b>	Call Abandonment Rate = (Count of Calls Terminated Before Answer During the Reporting Period) / (Count of All Calls Placed in Queue During the Reporting Period)
<b>GE-4</b>	<b>Average Response Interval</b>	Average Response Interval = $\Sigma$ [(Query Response Date & Time) - (Query Submission Date & Time)] / (Number of Queries Submitted in Reporting Period)
<b>Billing (BI)</b>		
<b>BI-1</b>	<b>Mean Time to Provide Recorded Usage Records</b>	Mean Time to Provide Recorded Usage Records = $\{ \Sigma [(Data Set Transmission Date) - (Date of Message Recording)] \} / (Count of All Messages Transmitted in Reporting Period)$
<b>BI-2</b>	<b>Mean Time to Deliver Invoices</b>	Mean Time to Deliver Invoices = $\Sigma [(Invoice Transmission Date) - (Date of Scheduled Bill Cycle Close)] / (Count of Invoices Transmitted in Reporting Period)$
<b>BI-3</b>	<b>% Invoice Accuracy</b>	% Invoice Accuracy = [(Number of Invoices Delivered in the Reporting Period that Have Complete Information, Reflect Accurate Calculations and are Properly Formatted) / Total Number of Invoices Issued in the Reporting Period] x 100
<b>BI-4</b>	<b>% Usage Accuracy</b>	% Usage Accuracy = [(Number of Usage Records Delivered in the Reporting Period That Reflected Complete Information Content and Proper Formatting) / (Total Number of Usage Records Transmitted)] x 100
<b>Operator Services/Directory Assistance &amp; Listings (OS, DA and DL)</b>		
<b>OS/DA-1</b>	<b>Mean Time To Answer</b>	Mean Time To Answer = $\Sigma [(Date and Time of Call Answer) - (Date and Time of Call Receipt)] / (Total Calls Answered on Behalf of CLECs in Reporting Period)$

## Service Quality Measurements

### Formula Quick Reference

Measurement Designation:	Measurement Name:	Measurement Formula:
DL-1	Average Time Allotted To Proof Listing Updates Before Publication	Average Time Allotted To Proof Listing Updates Before Publication = $\Sigma[(\text{Date \& Time of Directory Publication Deadline}) - (\text{Date and Time Updates Available for Proofing})] / \text{Number of Updates Sent for Proofing}$
<b>Network Performance (NP)</b>		
NP-1	% Call Completion	% Call Completion = $[(\text{Total number of blocked call attempts during busy hour}) / (\text{Total number of call attempts during busy hour})] \times 100$ . (inbound and outbound call attempts would be measured separately)
NP-2	Meantime To Notify CLEC	Meantime To Notify CLEC = $\Sigma[(\text{Date and Time ILEC Notified CLEC}) - (\text{Date and Time ILEC detected network incident})] / \text{Count of Network Incidents}$
NP-3	Network Performance Parameters	Network Performance Parameters = $\Sigma(\text{Network Performance Parameter Result}) / (\text{Number of Tests Conducted})$
<b>Collocation Provisioning (CP)</b>		
CP-1	Meantime To Respond To Collocation Request	Meantime To Respond To Collocation = $\Sigma [(\text{Request Response Date}) - (\text{Request Submission Date})] / \text{Count of Request Responses Issued}$
CP-2	Meantime To Provide Collocation Arrangement	Meantime To Provide Collocation Arrangement Request = $\Sigma [(\text{Date \& Time Collocation Arrangement is Complete}) - (\text{Date \& Time Collocation application submitted})] / \text{Number of Collocation Arrangements Complete}$
CP-3	% Due Dates Missed	% Due Dates Missed = $(\text{Number of Orders Not Completed By ILEC Committed Due Date}) / \text{Total Number of Orders Completed During the Reporting Period}$
<b>Database Updates (DU)</b>		
DU-1	Average Update Interval	Average Update Interval = $\Sigma [(\text{Completion Date \& Time of Database Update}) - (\text{Submission Date and Time of Database Change})] / \text{Total Number of Updates Completed During Reporting Period}$
DU-2	% Update Accuracy	% Update Accuracy = $[\text{Number of Updates Completed Without Error}] / (\text{Number Updates Completed}) \times 1001$
<b>Interconnect / Unbundled Elements and Combos (IUE)</b>		
IUE-1	Function Availability	Function Availability <sup>1</sup> = $(\text{Amount of Time}^2 \text{ a Functionality is Useable}^1 \text{ by a CLEC in a Specified Period}) / (\text{Total Time}^2 \text{ Functionality Was Intended to Be Useable})$  Notes: 1. These measures may also be expressed in the negative, that is, in term of unavailability. 2. In some instances, rather than time, the availability will be expressed in terms of transactions executed successfully compared to transactions attempted.

## Service Quality Measurements

### Formula Quick Reference

Measurement Designation:	Measurement Name:	Measurement Formula:
IUE-2	Timeliness of Element Performance	Timeliness of Element Performance = (Number of Times Functionality Executes Successfully Within the Established Timeliness Standard)/(Number of Times Execution of Functionality was Attempted)

# Service Quality Measurements

## Measurement Detail

### **Measurement Detail:**

- Highlights the business implications of each measurement function
- Details the measurement methodology, analogous retail functions, reporting dimensions, and objective performance standard in the absence of ILEC retail performance results

# Service Quality Measurements

## Measurement Detail

### Pre-Ordering (PO)

The content of this section has been moved to the “General” section.

### Ordering and Provisioning (OP)

<b>Function:</b>	<b>Order Completion Intervals</b>
<b>Business Implications:</b>	<p>In order to be successful in the marketplace, CLECs must be capable of delivering service in time frames equal to or better than the ILEC delivers for comparable service configurations and activities. Likewise, CLECs’ customers will be dissatisfied if requested services or features are not delivered when promised. The “average completion interval” measure monitors the time required by the ILEC to deliver integrated and operable service components requested by the CLEC, regardless of whether service resale, unbundled network elements or interconnection service delivery methods are employed. When the service delivery interval of the ILEC is measured for comparable services, a conclusion can be drawn regarding whether or not CLECs have a reasonable opportunity to compete for customers. Timely provisioning of interconnect trunks and inbound augments by the ILEC can prevent customer harm from call blocking before the problem occurs.</p> <p>The “orders completed on time” measure monitors the reliability of ILEC commitments with respect to committed due dates to assure that CLECs can reliably quote expected due dates to their retail customers. In addition, when monitored over time, the “average completion interval” and “percent completed on time” may prove useful in detecting developing capacity issues. The “average offered interval” indicates whether both ILEC and CLEC have the same scheduling opportunities for service delivery. The measure also shows non-parity if the ILEC’s offered intervals match more closely the completion intervals for its customers than do the ILEC’s offered and completion intervals for CLEC customers. CLECs need to honor their offered intervals to retain customers.</p> <p>Timely delivery of interconnect trunks and augments based on CLEC traffic projections rather than current utilization is a significant capacity parity issue. Because of the ILEC’s more extensive network and greater use of DEOTs (direct end office trunks), ILECs typically do not need to augment their own trunks until utilization reaches 85%. A CLEC, however, is very likely to see its 50% utilization rate jump to 100% with the addition of one or two large customers. An ILEC should not deny the CLEC’s request for inbound interconnect trunk augments when the CLEC’s current utilization level does not match the percentage level at which the ILEC augments its own trunks. The ILEC’s network should meet the CLEC’s forecasted or otherwise formally communicated business needs for augment trunks and DS3 trunks (which must be in place before local tandem trunks and DEOT orders are placed).</p>
<b>Measurement Methodology:</b>	<p><b>Average Completion Interval</b> = <math>\Sigma [(\text{Completion Date \&amp; Time}) - (\text{Order Submission Date \&amp; Time})] / (\text{Count of Orders Completed in Reporting Period})</math></p> <p><b>% Orders Completed on Time</b> = <math>(\text{Count of Orders Completed within ILEC Committed Due Date}) / (\text{Count of Orders Completed in Reporting Period}) \times 100</math></p>

# Service Quality Measurements

## Measurement Detail

**Average Offered Interval = [(Date & Time Due Date) – (Date & Time of Receipt of Service Request)] / (Number of Committed Due Dates)**

**For CLEC Results:** The actual completion interval is determined for each order processed during the reporting period. The completion interval is the elapsed time from the ILEC receipt of a syntactically correct order from the CLEC to the ILEC's return of a valid completion notification to the CLEC. Elapsed time for each order is accumulated for each reporting dimension (see below). The accumulated time for each reporting dimension then is divided by the associated total number of orders completed within the reporting period.

The percentage of orders completed on time is determined by first counting, for each specified reporting dimension, both the total numbers of orders completed within the reporting interval and the number of orders completed by the committed due date (as specified on the initial FOC returned to the CLEC). For each reporting dimension, the resulting count of orders completed no later than the committed due date is divided by the total number of orders completed with the resulting fraction expressed as a percentage.

Although CLEC forecasts are not technically "orders", the CLEC forecast provides the ILEC with the information it needs to be able to augment its inbound trunks (and other ILEC trunks needed for efficient interconnection) in a timely manner to handle the forecasted CLEC calling volume. To calculate ILEC trunk augments as a percentage of "orders" completed on time, the due date is the date on which the additional trunk is needed by the CLEC, as stated in the forecast. The total number of ILEC augments completed no later than the due date is divided by the total number of ILEC augments completed in the reporting period. The resulting fraction is expressed as a percentage.

The offered interval is the due date that an ILEC provides the CLEC on a firm order confirmation (i.e. the earliest date on which the CLEC's customer can obtain service without paying for an escalation).

**For ILEC Results:** Same as for CLEC with the clarifications noted below.

### Other Clarifications and Qualification:

- The elapsed time for an ILEC order is measured from the point in time when the ILEC customer service agent enters the order into the ILEC order processing system until the date and time that the ILEC personnel log actual completion of all work necessary to permit service initiation, whether or not the ILEC initiates customer billing at that point in time.
- Results for the CLECs are captured and retained at the order level (e.g., unique PON).
- The Completion Date and Time is the date upon which the ILEC issues the Order Completion Notice to the CLEC.
- If the CLEC initiates a supplement to the originally submitted order and the supplement reflects changes in customer requirements (rather than responding to ILEC initiated changes), then the order submission date and time will be the date and time of the ILEC receipt of a syntactically correct order supplement.
- No other supplemental order activities will result in an update to the order submission date and time used for the purposes of computing the order completion interval.

# Service Quality Measurements

## Measurement Detail

	<ul style="list-style-type: none"> <li>• See "Order Status" measurement detail for a discussion of ILEC analogs, receipt of a syntactically correct order and return of a valid completion notice.</li> <li>• Elapsed time is measured in hours and hundredths of hours rounded to the nearest hundredth of an hour.</li> <li>• The accumulation of elapsed time continues through off-schedule, weekends and holidays.</li> </ul>
<b>Reporting Dimensions:</b> <ul style="list-style-type: none"> <li>• Company</li> <li>• Service (See Appendix A)</li> <li>• Activity (See Appendix A)</li> <li>• Geographic Scope</li> <li>• Volume Category</li> </ul>	<b>Excluded Situations:</b> <ul style="list-style-type: none"> <li>• Canceled orders</li> <li>• ILEC Orders associated with internal or administrative use of local services</li> <li>• Orders where CLEC has selected a longer due date than requested.</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• CLEC Order Number</li> <li>• Order Submission Date</li> <li>• Order Submission Time</li> <li>• Order Completion Date</li> <li>• Order Completion Time</li> <li>• Service Type</li> <li>• Activity Type</li> <li>• Geographic Scope</li> </ul>	<b>Data Retained Relating To ILEC Performance:</b> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Average Order Completion Interval</li> <li>• Standard Error for the Order Completion Interval</li> <li>• Count of Orders Completed</li> <li>• Count of Orders Completed by the Due Date</li> <li>• Average Offered Interval</li> <li>• Service Type</li> <li>• Activity Type</li> <li>• Geographic Scope</li> <li>• Volume Category</li> </ul>
<b>Performance Standard in Absence of ILEC Results:</b>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• Unless otherwise noted, the order completion interval for installations that do not require a premise visit and do not require anything beyond software updates is 1 business day.</li> <li>• Unless otherwise noted, the order completion intervals for installations that involve a premise visit or physical work is three business days.</li> <li>• Installation Interval Exceptions:             <ul style="list-style-type: none"> <li>• UNE Platform (at least DS0 loop + local switching + common transport elements) installation interval is 1 business day whether or not premise work is required.</li> <li>• The installation interval for unbundled loops is always 1 business day.</li> <li>• UNE Channelized DS1 (DS1 unbundled loop + multiplexing) installation interval is within 2 business days.</li> <li>• Unbundled Switching Element installation interval is within 2 business days</li> <li>• DS0/DS1 Dedicated Transport installation interval is within 3 business days (See Network Performance measurement detail for related standards on interconnect trunks and augment inbound trunk provisioning thresholds)</li> <li>• The installation interval for All Other Dedicated Transport is within 5 business days.</li> <li>• Access DS3s used for local interconnects within 10 days.</li> </ul> </li> </ul>

# Service Quality Measurements

## Measurement Detail

	<ul style="list-style-type: none"> <li>• The installation interval for all orders involving only feature modification is 5 hours.</li> <li>• Order completion interval for all disconnection orders is 1 business day.</li> </ul> <p><u>Interconnect Augment Trunks:</u> ILECs must meet relevant tariff, service level agreement or contract intervals for T-1s/DS0s and DS1 provisioning 98% of the time</p> <p>Although CLECs do not order them per se, ILECs must also provide inbound trunk augments in line with CLEC capacity projections. CLECs require these augments at utilization thresholds that are lower than the ILEC's own thresholds to reflect the differences in network size and the impact of growth in CLEC customer numbers on inbound as well as outbound capacity needs. The threshold below for augment trunk provisioning will afford CLECs a reasonable opportunity to compete. Individual CLECs may agree to different thresholds in negotiation with ILECs on inbound trunk augments:</p> <ul style="list-style-type: none"> <li>• DEOTS REPRESENT LESS THAN 50% OF COMBINED INBOUND/OUTBOUND CAPACITY – augment trunk orders must be provided when utilization reaches 60% on the Erlang-B.01 scale.</li> <li>• DEOTS REPRESENT MORE THAN 50% OF TOTAL CAPACITY – augment trunk orders may be placed when utilization is at 75% on the Erlang-B.01 scale.</li> </ul>
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<b>Function:</b> <b>Business Implications</b>	<b>Order Processing Quality</b> <p>Customers expect that their service provider will deliver precisely the service ordered and all the features specified. A service provider that is unreliable in fulfilling orders, will not only generate ill-will with customers when errors are made, but will also incur higher costs to rework orders and to process customer complaints. This measurement monitors the accuracy of the provisioning work performed by the ILEC, in response to CLEC orders. When the ILEC provides the comparable measure for its own operation, it is possible to know if provisioning work performed for CLECs is at least as accurate as that performed by the ILEC for its own retail local service operations.</p> <p>Many of the order transactions between ILEC and CLEC are designed to be entirely automated. For these transactions, any "fall out" from the mechanized process will result in a higher likelihood of delay or inaccurate processing. The availability of flow through order entry without manual intervention on the ILEC's part decreases the occurrence of rekeying errors and makes the CLEC more accountable for its order quality. Measurements are needed (1) to monitor the extent to which human intervention is required for CLEC automated order transactions and (2) to compare the results to ILEC order processing flow through. CLECs must be assured that their orders have the same opportunity as the ILEC's orders for timely and accurate processing.</p> <p>Sometimes CLECs receive order rejections and must resubmit orders for failures on the part of the ILECs' systems or lack of notice or training on changed formats and processes for order entry. Sometimes orders are rejected with no explanation or delayed for invalid queries by the ILECs. Often ILEC electronic editing systems reject an order one error at a time, rather than capture all the issues with the order on one submission. These rejections and resubmissions not only are burdensome to CLECs but delay service delivery to the customer.</p>
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# Service Quality Measurements

## Measurement Detail

### Measurement Methodology:

**% Order Accuracy** =  $(\Sigma \text{ Orders Completed w/o Error}) / (\Sigma \text{ Orders Completed}) \times 100$

**% Mechanized Order Flow Through** =  $[(\text{Total Number of Orders Processed Without Manual Intervention}) / (\text{Total Number of Orders Completed})] \times 100$

**% Orders Rejected** =  $[\text{Number of Orders Rejected Due to Error or Omission} / \text{Number of Orders Received by ILEC During Reporting Period}] \times 100$

**Average Submissions Per Order** =  $\Sigma[(\text{Number of Firm Order Confirmations}) + (\text{Number of Rejections Issued})] / (\text{Number of Firm Order Confirmations})$

### For CLEC Results:

#### Order Accuracy:

For each order completed during the reporting period, the original account profile and the order that the CLEC sent to the ILEC are compared to the services and features reflected upon the account profile as it existed following completion of the order by the ILEC. An order is "completed without error" if all service attribute and account detail changes (as determined by comparing the original and the post order completion account profile) completely and accurately reflect the activity specified on the original and any supplemental CLEC orders. "Total number of orders completed" refers to the total number of order completion notices sent to the CLEC by the ILEC for each reporting dimension identified below.

#### % Mechanized Order Flow Through:

"Percentage Mechanized Order Flow Through" identifies the total orders processed from acceptance of the ILEC gateway to the ILEC service order processor and other legacy systems without manual intervention. For each type of order, the count includes orders that arrive at the destination work group(s) without human intervention from initial order creation by the customer contact agent until the time the order is delivered to the appropriate work group responsible for physical work. The resulting count is divided by the total number of orders (of the same type) that were processed during the reporting period with the result expressed as a percentage.

#### % Orders Rejected:

The percentage of orders rejected is the count of (1) order submissions where the ILEC returns a notice of a syntax rejection to the CLEC and (2) order submissions where the ILEC returns a notice that the CLEC order was rejected by legacy system edits. The resulting combined count of rejections is divided by the count of orders submitted (For EDI interfaces, the orders submitted would be the combined count of positive and negative 997 messages issued upon receipt of the CLEC order.)

#### Average Number of Submissions Per Order:

The "average number of submissions per order" is derived by adding the number of Firm Order Confirmations sent to the CLEC during the reporting period and the number of rejects issued to the CLEC during the reporting period. This sum is then divided by the number of Firm Order Confirmations to determine the average number of submissions per order for the CLEC.

**For ILEC Results:** Same computation as for the CLEC with the clarifications noted below.

#### Other Clarifications and Qualification:

Ordering (OP)

Quality Measurements 17.0

**Order Supplements** - If the CLEC initiates any supplements to the originally submitted order, for the purposes of reflecting changes in customer

# Service Quality Measurements

## Measurement Detail

<b>Reporting Dimensions:</b> <ul style="list-style-type: none"> <li>• Company</li> <li>• Interface Type</li> <li>• Service Type (See Appendix A)</li> <li>• Order Activity (See Appendix A)</li> <li>• Volume Category</li> </ul>	<b>Excluded Situations:</b> <ul style="list-style-type: none"> <li>• Orders canceled by the CLEC</li> <li>• Order Activities of the ILEC associated with internal or administrative use of local services.</li> <li>• For resubmissions impact on due date measure, ILEC would not have to comply if tying final accepted order to original order is technically infeasible (But feasibility issue will be revised as systems are upgraded.)</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Count of Orders Completed Without Manual Intervention</li> <li>• Count of Firm Order Confirmations</li> <li>• Count of Syntax Rejects</li> <li>• Count of Legacy System Rejects</li> <li>• Count of Orders Submitted</li> <li>• Interface Type</li> <li>• Order Activity Type</li> <li>• Original order date for rejected orders</li> <li>• Rejection Notice Date and Time</li> <li>• Service Type</li> <li>• Volume Category</li> <li>• Manual Fallout (for Mechanized Orders Only)</li> </ul>	<b>Data Retained Relating To ILEC Performance:</b> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Count Orders Completed Without Manual Intervention</li> <li>• Count of Order Confirmations</li> <li>• Count of Syntax Rejects</li> <li>• Count of Legacy System Reject</li> <li>• Count of Orders Submitted</li> <li>• Interface Type</li> <li>• Order Activity</li> <li>• Service Type</li> <li>• Volume Category</li> </ul>
<b>Performance Standard in Absence of ILEC Results:</b>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete.</p> <ul style="list-style-type: none"> <li>• Completed CLEC orders, by reporting dimension, are accurate no less than 99% of the time.</li> <li>• Mechanized flow through of orders occurs at least 98% of the time.</li> <li>•</li> </ul>

<b>Function: Business Implications:</b>	<b>Order Status</b> <p>When customers call their service providers, they expect prompt answers regarding the progress on their orders. Likewise, when changes must be made, such as to the expected delivery date, customers expect that they will be immediately notified so that they may modify their own plans. A service provider that cannot fulfill such expectations will generate customer dissatisfaction. Lengthy delays in exchange of status information will result in the delay of other customer affecting activities. For example, inside wiring activity often is initiated after the firm order confirmation is returned, and customer billing must await CLEC receipt of the order completion notice. The order status measurements monitor, when compared to the ILEC result, whether the CLEC has timely access to order progress information so that the customer may be updated or notified promptly when changes and rescheduling are necessary.</p>
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# Service Quality Measurements

## Measurement Detail

### Measurement Methodology

The “% jeopardies returned” measure for the CLEC, when reported in comparison to the ILEC result, will gauge whether initial commitments to the CLEC for order processing are at least as reliable as the commitments the ILEC makes for its own operations.

CLECs also need adequate notice of order completion activities. They can be made to look disorganized by ILECs providing service without such advance notice: Customers and CLECs may even be unable to schedule necessary vendors on the scene to complete the installation, resulting in ILEC technicians being turned away and customer frustration with the CLEC. An ILEC could cause a great deal of harm to the CLEC competitively, yet look like it is providing parity or above parity service by the results other provisioning measures. A measurement capturing any non-parity in the occurrence of surprise or short-notice service deliveries also is critical to affording CLECs a reasonable opportunity to compete.

Order status intervals measure the elapsed time necessary to provide a notice to the CLEC that specific events have occurred or particular conditions have been encountered when processing an order. Order status includes notification of order rejection due to violation of order content or syntax requirements, confirmation of order acceptance, jeopardy of an order due to the inability to complete work as originally committed and work completion notification. The interval associated with each of these four preceding major categories of status must be separately monitored and reported.

**Reject Interval** =  $\Sigma[(\text{Date and Time of Order Rejection}) - (\text{Date and Time of Order Receipt or Acknowledgment})]/(\text{Number of Orders Rejected in Reporting Period})$

Reject Interval (syntax) is the elapsed time between the ILEC receipt of an order from the CLEC to the ILEC return of a notice of a syntax rejection to the CLEC. The time measurement starts when the ILEC receives the order from the CLEC. The time measurement stops when the ILEC returns a rejection notice to the CLEC. The elapsed time is accumulated by order type with the resulting accumulated time then divided by the count of rejected orders associated with the particular order type.

Reject Interval (legacy system) is the elapsed time between the ILEC’s acknowledgement /acceptance of an order from the CLEC to the ILEC’s return of a rejection notice to the CLEC. The time measurement starts when the ILEC accepts or acknowledges the order from the CLEC as syntactically correct. The time measurement stops when the ILEC returns a rejection notice to the CLEC. The elapsed time is accumulated by order type with the resulting accumulated time then divided by the count of rejected orders associated with the particular service and order type.

**FOC Interval** =  $\Sigma[(\text{Date and Time of Firm Order Confirmation}) - (\text{Date and Time of Order Acknowledgment})]/(\text{Number of Orders Confirmed in Reporting Period})$

Interval for Return of a Firm Order Confirmation (FOC Interval) is the elapsed time between the ILEC acceptance of a syntactically correct order and the return of a confirmation to the CLEC that the order will be worked as submitted or worked with the modifications specified on the confirmation. The time measurement starts when the ILEC accepts (acknowledges) the order from the CLEC. The time measurement stops when the ILEC returns a valid firm order confirmation to the CLEC. The elapsed time is accumulated by order type with the resulting accumulated time then divided by the count of orders associated with the particular order type.

# Service Quality Measurements

## Measurement Detail

**Jeopardy Interval** =  $\Sigma[(\text{Date and Time of Committed Due Date for the Order}) - (\text{Date and Time of Jeopardy Notice})]/(\text{Number of Orders Jeopardized in Reporting Period})$ . For all orders jeopardized on or before the scheduled due date.

Jeopardy Interval is the remaining time between the pre-existing committed order completion date and time (communicated via the FOC) and the date and time the ILEC issues a notice to the CLEC indicating an order is in jeopardy of missing the due date. The scheduled order completion time will be assumed to be 5:00 p.m. local time unless other information is communicated in the FOC. The date and time of the jeopardy notice delivered by the ILEC is subtracted from the scheduled completion date to establish the jeopardy interval for any order placed in jeopardy before its scheduled due date. The jeopardy interval is accumulated by standard order activity with the resulting accumulated time then divided by the count of orders placed in jeopardy before the due date for each order activity.

**Completion Interval** =  $\Sigma[(\text{Date and Time of Notice of Completion Issued to the CLEC}) - (\text{Date and Time of Work Completion by ILEC})]/(\text{Number of Orders Completed in Reporting Period})$

Completion Notice Interval is the elapsed time between the ILEC technician's reported completion of physical work and the issuance of a valid completion notice to the CLEC. Where physical work is not required, such as in the case of software-only changes, the elapsed time will be measured beginning at 5:00 p.m. local time of the date for the committed completion and will end when the ILEC returns a valid completion notice to the CLEC. If a valid completion notice is returned before 5:00 p.m. on the committed completion date and no physical work is involved, then the elapsed time will be recorded as 1/10 hour. The elapsed time is accumulated by order type with the resulting accumulated time then divided by the count of completion notices returned for each service and order type.

**% Completions or Attempts without Notice or with Less Than 24 Hours Notice.**  
=  $[\text{Completion Dispatches (Successful and Unsuccessful) With No FOC or FOC Received Within 24 Hours of Due Date/All Completions}] \times 100$

Completion and Completion Attempts include any delivery of service (successful or not successful) for which the CLEC did not receive sufficient prior notification.

**For ILEC Results:** The ILEC reports completions for which ILEC technicians delivered service to customers without giving sufficient advance notice to customers, sales or to internal account team to arrange for appropriate vendors to be on hand. Calculation of insufficient notice is similar to CLEC calculation (none or less than 24 hours). Similar surprise service deliveries are calculated for ILEC affiliate's account representatives.

**For CLEC Results:** Calculation would exclude any successful or unsuccessful service delivery that CLEC was informed of at least 24 hours in advance. ILEC may also exclude from calculation deliveries on less than 24 hours' notice that CLEC requested.

**% Jeopardies** =  $(\text{Number of Orders Jeopardized in Reporting Period})/(\text{Number of Orders Confirmed in Reporting Period})$

% Jeopardies is the percentage of total orders processed for which the ILEC notifies the CLEC that the work will not be completed as committed on the original FOC.

# Service Quality Measurements

## Measurement Detail

The measurement result is derived by dividing the count of jeopardy notices the ILEC issues to the CLEC by the count of FOCs returned by the ILEC during the identical period. Both the "Number of Orders Jeopardized in Reporting Period" and "Number of Orders Confirmed in Reporting Period" are utilized in other status measurement computations and have identical meaning and derivation for this measurement.

**For ILEC Results:** Same computation as the CLEC with the clarifications outlined below.

### Other Clarifications and Qualification:

- When the ILEC processes orders for a CLEC via different interfaces (e.g., ASR and EDI) then the preceding measurement must be computed for each interface arrangement.
- All intervals are measured in hours and hundredths of hours rounded to the nearest hundredth.
- Because this should be a highly automated process, the accumulation of elapsed time continues through off-schedule, weekends and holidays.
- "Syntactically correct" means all fields required to process an order are populated and reflect the correct format as agreed and documented in the current interface specifications.
- The ILEC service agent's attempt to submit an order for processing by the ILEC OSS is considered equivalent to the ILEC acknowledgment of the CLEC's order.
- The ILEC OSS return of any indication to the service agent that an order cannot be processed as submitted is considered equivalent to the ILEC return of a rejection notice to the CLEC.
- Return of any information (e.g., order recapitulation) to the ILEC customer service agent that indicates no errors are evident or that an order can be processed, is the equivalent of the ILEC return of a FOC to the CLEC.
- Logging of information in the ILEC OSS, whether manual or automatic, that indicates an order may not be completed by the existing due date, is equivalent of the return of a jeopardy notice to the CLEC regardless of whether or not the ILEC takes action based upon such information.
- Automatic logging of work completion and manual logging of work completion, whether input directly to the ILEC OSS or into an intermediate storage devise, is considered the equivalent of the return of a completion notice to the CLEC.

### Reporting Dimensions:

- Standard Order Activities (See Appendix A)
- Company
- Interface Type
- Service Type (See Appendix A)
- Geographic Scope

### Excluded Situations:

- Rejection Interval - None
- Jeopardy Interval - None
- Firm Order Confirmation Interval - None
- Completion Notification Interval - None
- % Jeopardies - None
- Completions or Attempts Without Notice or With less than 24-hours' notice delivery that the CLEC specifically requested.

# Service Quality Measurements

## Measurement Detail

Data Retained Relating To CLEC Experience:		Data Retained Relating To ILEC Performance:	
<ul style="list-style-type: none"> <li>• Report Month</li> <li>• Interface Type</li> <li>• Service Type</li> <li>• CLEC Order Number</li> <li>• Order Submission Date</li> <li>• Order Submission Time</li> <li>• Status Type (Rejection, FOC, Jeopardy Type, Completion Notice)</li> <li>• Status Notice Date</li> <li>• Status Notice Time</li> <li>• Standard Order Activity</li> <li>• Order Due Date</li> </ul>		<ul style="list-style-type: none"> <li>• Report Month</li> <li>• Interface Type</li> <li>• Service Type</li> <li>• Status Type (Rejection, FOC, Jeopardy Type, Completion Notice)</li> <li>• Average Status interval</li> <li>• Standard error of status interval</li> <li>• Number of Orders Reflected In Result</li> <li>• Standard Order Activity</li> <li>• Number of Statuses Provided</li> </ul>	
<b>Performance Standard in Absence of ILEC Results</b>		<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• no less than 97% of Rejects in any category for a reporting period are returned within 15 seconds</li> <li>• all Firm Order Confirmations are returned within 4 hours</li> <li>• no less than 97% of order completions in any category are returned within 30 minutes of work completion</li> <li>• 99.9% of completion and completion attempts should receive more than 24 hours notice.</li> <li>• no less than 97% of Jeopardies for any category are returned to the CLEC a minimum of 2 business days in advance of the due date indicated on the most recent FOC</li> <li>• no more than 5% of the total number of orders should result in a Jeopardy in any given report period.</li> </ul>	

<b>Function:</b>	<b>Coordinated Cutovers</b>
	Customers must not be subjected to unscheduled service disruptions because of lengthy or uncoordinated cutovers of loops with interim or permanent number portability or the provision of any other UNEs that require disconnection and reconnection of a customer.
<b>Business Implications:</b>	Customers may suffer loss of dialtone due to early cutovers (ILEC takes down loop before scheduled date for CLEC loop to be ready) in cases where interim number portability is involved. With Permanent Number Portability (PNP), customers may not receive inbound calls if the ILEC (1) does not provide timely disconnection of the ILEC's old translations for routing the number or (2) does not employ or prematurely takes down the 10-digit trigger designed to ensure proper routing during the transition. Service may also be disrupted in conversions from ILNP-to-PNP or through premature disconnects in coordinated cutovers of UNE combinations. The percentage of early and late cutovers must be monitored to ensure that CLECs' customers are not disproportionately losing dialtone or having inbound calling blocked.

# Service Quality Measurements

## Measurement Detail

<b>Measurement Methodology:</b>	<p><b>Average Coordinated Conversion Interval = <math>\Sigma[(\text{Date \&amp; Time Re-termination is Completed by ILEC}) - \text{Date \&amp; Time of Initial Service Interruption (disconnect for Customer Transferring Service)}] / (\text{Count of Completed Coordinated Conversions in Reporting Period})</math></b></p> <p><b>% Service Loss from Early Cuts = <math>(\text{Customer Conversion Where Cutover Time is Earlier Than Due Date and Time}) / (\text{All Customer Conversions Completed During Reporting Period}) \times 100</math></b></p> <p><b>% Service Loss from Late Cuts = <math>(\text{Customer Conversions Where Cutover Time is More than 30 Minutes Past Due Date and Time}) / (\text{All Customer Conversions Completed During Reporting Period}) \times 100</math></b></p> <p><b>For CLEC Results:</b></p> <p>Average Coordinated Conversion Interval: The elapsed time between the disconnection of an access line (for a retail customer of the ILEC) from the switch port of the ILEC to the time that the ILEC finishes both the physical work necessary to re-terminate the loop (at the point of re-termination specified by the CLEC) and receives CLEC confirmation that electrical continuity exists. The elapsed time is accumulated for the reporting period and divided by the number of loops that were re-terminated on a coordinated basis.</p> <p>% Service Loss (Early/Late Cuts): For hot loop cuts, the same loop is moved from an existing port to what is effectively a different port (The CLEC collocation point). Translation disconnections also are reported if they occur too early or late in a conversion involving local number portability. For each conversion, the ILEC will track whether the cutover time (for facilities and translations) was earlier or later than the committed due date and time that appeared on the FOC. The total number of early cutovers will be divided by the total number of customer conversions that were completed during the reporting period. Likewise, the total number of cutovers that were completed more than 30 minutes past the committed due date and time will be divided by the total number of customer conversions that were completed during the reporting period. For both formulas, the resulting ratio will be expressed as a percentage.</p> <p><b>For ILEC Results:</b> ILECs would use retail residential or business POTS outside move activity as an analog. An outside move occurs when a customer, with existing service, moves from one premises to another within the same central office area without disconnecting and reconnecting service. With inside moves the customer keeps their own phone number. Although an outside move involves disconnecting an existing loop from an operating port and reconnecting a different loop (within the same office) to that same port, the work involved is very similar (i.e. coordinated re-termination).</p>
<b>Reporting Dimensions:</b> <ul style="list-style-type: none"> <li>• Company</li> <li>• Type of Loop or UNE Combination Cutover and Type of NP involved (i.e. ILNP, PNP or ILNP-to-PNP conversion). See also Service Type (Appendix A)</li> <li>• Order Activity</li> <li>• Geography</li> <li>• Volume Category</li> </ul>	<b>Excluded Situations:</b> <p>None</p>

# Service Quality Measurements

## Measurement Detail

Data Retained Relating To CLEC Experience:		Data Retained Relating To ILEC Experience:	
<ul style="list-style-type: none"> <li>Report Month</li> <li>Service Type</li> <li>Order Activity</li> <li>Committed Due Date and Time (from Firm Order Confirmation)</li> <li>Completion Date and Time</li> <li>Geographic Scope</li> <li>Volume Category</li> </ul>		<ul style="list-style-type: none"> <li>Report Month</li> <li>Number of Early Conversions</li> <li>Number of Conversions &gt;30 Minutes Late</li> <li>Total Number of Conversions</li> <li>Average Conversion Interval</li> <li>Standard Error of Conversion Interval</li> <li>Geographic Scope</li> <li>Volume Category</li> </ul>	
<b>Performance Standard in Absence of ILEC Results:</b>		<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>98% of coordinated cutovers have ILEC and CLEC work completed within 5 minutes of one another and 100% within 15 minutes.</li> <li>98% of unscheduled disruptions causing loss of dialtone or inbound call blocking should be corrected in 1 hour and 100% within 2 hours.</li> </ul>	

<b>Function:</b>	<b>Held Orders</b>
<b>Business Implications:</b>	Customers expect that work will be completed when promised. Therefore, when delays occur in completing CLEC orders, such delays must be no longer than the average period of time the ILEC's own customer orders are held.
<b>Measurement Methodology:</b>	<p><b>Held Order Interval</b> = <math>\Sigma(\text{Reporting Period Close Date} - \text{Committed Order Due Date}) / (\text{Number of Orders Pending and Past The Committed Due Date})</math> for all orders pending and past the committed due date</p> <p><b>For CLEC Results:</b> This metric is computed at the close of each report period. The held order interval is established by first identifying all pending orders at that time that (1) have not been reported "completed" via a valid completion notice and (2) have passed the currently "committed completion date." For each such order, the number of calendar days between the committed completion date and the close of the reporting period is established and represents the held order interval for that particular order. The held order interval is accumulated (by service type and reason for the hold, if identified) and then divided by the number of held orders within the same category to produce the mean held order interval.</p> <p><b>Orders Held for <math>\geq 90</math> days</b> = <math>(\# \text{ of Orders Held for } \geq 90 \text{ days}) / (\text{Total \# of Orders Pending But Not Completed}) \times 100</math></p> <p><b>Orders Held for <math>\geq 15</math> days</b> = <math>(\# \text{ of Orders Held for } \geq 15 \text{ days}) / (\text{Total \# of Orders Pending But Not Completed}) \times 100</math></p> <p>This "percentage orders held" measure is complementary to the held order interval but is designed to detect orders continuing in a "non-completed" state for an extended period of time. Computation of this metric uses a subset of the data accumulated for the "held order interval" measure. All orders, for which the "held order interval" equals or exceeds 90 (or 15) days, are counted by service type and reason for the hold.</p>

# Service Quality Measurements

## Measurement Detail

	<p>The total number of pending and past due orders for the same category are counted (as was done for the held order interval) and divided into the count of orders held past 90 (or 15) days.</p> <p><b>For ILEC Results:</b> Same computation as for the CLEC with the clarifications provided below..</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"> <li>• The “held order” measure established by some state commissions as part of minimum service standards is analogous to this proposed measure but, because it is typically limited to monitoring only those orders held because of facility shortages, needs to be expanded to include all reasons that an order is pending and past due.</li> <li>• <b>Order Supplements</b> - If the CLEC initiates a supplement to the originally submitted order for the purpose of reflecting changes in customer requirements, then the due date returned on the FOC will be the basis for the preceding calculations. No other supplemental order activities will result in an update to the committed due date.</li> <li>• See “Order Status” measurement definitions for discussion of the ILEC analog for a completion notice.</li> <li>• The held order interval is measured in calendar rather than business days.</li> </ul>
<p><b>Reporting Dimensions:</b></p> <ul style="list-style-type: none"> <li>• Company</li> <li>• Service Type (See Appendix A)</li> <li>• Reason for Hold (no facilities, no equipment, workload, other)</li> <li>• Geographic Scope</li> </ul>	<p><b>Excluded Situations</b></p> <ul style="list-style-type: none"> <li>• Any orders canceled by the CLEC will be excluded from this measurement.</li> <li>• Order Activities of the ILEC associated with internal or administrative use of local services</li> </ul>
<p><b>Data Retained Relating To CLEC Experience:</b></p> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• CLEC Order Number</li> <li>• Committed Due Date</li> <li>• Report Period Close</li> <li>• Service Type</li> <li>• Hold Reason</li> <li>• Geographic Scope</li> </ul>	<p><b>Data Retained Relating To ILEC Performance:</b></p> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Average Held Order Interval</li> <li>• Standard Error for Average Held Order Interval</li> <li>• Number of Orders Rejected</li> <li>• Service Type</li> <li>• Hold Reason</li> <li>• Geographic Scope</li> </ul>
<p><b>Performance Standard in Absence of ILEC Results:</b></p>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• Less than 0.1% of orders held for more than 15 calendar days.</li> <li>• No orders held for more than 90 calendar days.</li> </ul>

# Service Quality Measurements

## Measurement Detail

### Maintenance and Repair (MR)

Function:	Time To Restore
<b>Business Implications:</b>	<p>Customers expect service to be restored promptly to the normal operating parameters whenever troubles are detected. The longer the time required to correct a service problem, the greater the customer dissatisfaction. Customers also need to know that the CLEC is monitoring the status of their repair closely. The CLEC, therefore, needs jeopardy notification if repair commitments are not going to be met. Both measures, when collected and compared for the CLEC and ILEC, monitor whether the CLEC receives the same intervals and jeopardy notices regarding repairs as the ILEC provides for its own or an affiliate's retail customers.</p>
<b>Measurement Methodology:</b>	<p><b>Mean Time To Restore = <math>\Sigma[(\text{Date and Time of Trouble Ticket Resolution Returned to CLEC}) - (\text{Date and Time of Trouble Ticket Referred to the ILEC})] / (\text{Count of Trouble Tickets Resolved in Reporting Period})</math></b></p> <p><b>For CLEC Results:</b> The restoral interval for resolution of customer requested maintenance and repair is the elapsed time, measured in hours and tenths of hours, measured from the CLEC submission of a customer trouble to the ILEC, regardless of the ultimate resolution of the trouble, to the time the ILEC returns a valid trouble resolution notification to the CLEC. The elapsed time is accumulated by service type and trouble disposition for the reporting period. The accumulated time is divided by the count of maintenance tickets reported as resolved by the ILEC (by service type and trouble type) during the report period.</p> <p><b>For ILEC Results:</b> Same computation as for the CLEC.</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"> <li>• Elapsed time is measured on a 24-hour-a-day, seven-days-a-week basis. The time is measured in hours and hundredths of hours rounded to the nearest hundredth hour.</li> <li>• Multiple reports for the same customer service are treated as the same incident only when a subsequent report is received for a customer service arrangement that already has an open ticket.</li> <li>• "Restore" means to return to the normally expected operating parameters for the service regardless of whether or not the service, at the time of trouble ticket creation, was operating in a degraded mode or was completely unusable.</li> <li>• A trouble is "resolved" when the ILEC issues notice to the CLEC that the customer's service is restored to normal operating parameters.</li> <li>• A trouble ticket or trouble report is any record (whether paper or electronic) used by the ILEC for the purpose of monitoring action and disposition of a service repair or maintenance situation.</li> <li>• ILEC acceptance of a trouble by the call receipt agent is considered equivalent to the CLEC logging or submitting a trouble to the ILEC.</li> <li>• The ILEC closure of a trouble ticket (whether automatic or manual) is considered equivalent to returning a trouble resolution notice to the CLEC.</li> </ul> <p><b>Mean Jeopardy Interval = <math>\Sigma [(\text{Date and Time of Committed Due Date for the Order}) - (\text{Date and Time of Jeopardy Notice})] / (\text{Number of Orders Jeopardized in Reporting Period})</math></b></p>

# Service Quality Measurements

## Measurement Detail

**CLEC Results: Jeopardy Interval** is the remaining time between the pre-existing committed maintenance or trouble handling appointment date and time and the date and time the ILEC issues a notice to the CLEC indicating an appointment is in jeopardy of being missed. The scheduled appointment time will be assumed to be 5:00 p.m. local time unless other information is communicated. The date and time of the jeopardy notice delivered by the ILEC is subtracted from the scheduled completion date to establish the jeopardy interval for any appointment placed in jeopardy. The jeopardy interval is accumulated by service group with the resulting accumulated time then divided by the count of scheduled appointments associated with the particular service.

**For ILEC Results:** Computations are the same as for the CLEC with the clarifications outlined below.

### Other Clarifications and Qualification:

All intervals are measured in hours and hundredths of an hour rounded to the nearest hundredth. The lack of electronic bonding for maintenance does not excuse the ILEC from jeopardy reporting requirements.

### Reporting Dimensions:

- Service Type (See Appendix A)
- Trouble Type
- Geographic Scope

### Excluded Situations:

- Trouble tickets that are canceled at the CLEC's request
- ILEC trouble reports associated with administrative service
- Instances where the CLEC or an ILEC customer requests that a ticket be "held open" for monitoring
- Subsequent Reports (additional reports on an already open ticket)
- Any trouble type tracking that parties agree are technically unfeasible or operationally prohibitive
- A trouble ticket created for tracking and/or monitoring requests for clarifying information (e.g. confirmation of customer ownership from CLEC support centers.
- Tickets used to track referrals of misdirected calls

# Service Quality Measurements

## Measurement Detail

Data Retained Relating To CLEC Experience:		Data Retained Relating To ILEC Performance:	
<ul style="list-style-type: none"> <li>• Report Month</li> <li>• CLEC Ticket #</li> <li>• Ticket Submission Time</li> <li>• Ticket Submission Date</li> <li>• Ticket Completion Time</li> <li>• Trouble Resolution Time</li> <li>• Trouble Resolution Date</li> <li>• Service Type</li> <li>• WTN or CKTID (a unique identifier for elements combined in a service configuration)</li> <li>• Trouble Type</li> <li>• Geographic Scope</li> </ul>		<ul style="list-style-type: none"> <li>• Report Month</li> <li>• Average Restoral Interval</li> <li>• Standard Error for the Average Restoral Interval</li> <li>• Service Type</li> <li>• Trouble Type</li> <li>• Geographic Scope</li> <li>• Number of Tickets</li> </ul>	
<b>Performance Standard in Absence of ILEC Results</b>		<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ol style="list-style-type: none"> <li>1. Out of Service conditions where dispatch is required: <ul style="list-style-type: none"> <li>• ≥90% resolved within 4 hours</li> <li>• ≥95% resolved within 8 hours</li> <li>• ≥99% resolved within 16 hours</li> </ul> </li> <li>2. Out of Service conditions where no dispatch is required: <ul style="list-style-type: none"> <li>• ≥85% resolved within 2 hours</li> <li>• ≥95% resolved within 3 hours</li> <li>• ≥99% resolved within 4 hours</li> </ul> </li> <li>3. ≥ all other troubles resolved within 24 hours</li> </ol>	

<b>Function:</b>	<b>Frequency of Repeat Troubles</b>
<b>Business Implications:</b>	Customers are keenly aware of the effectiveness of repair activities. First time troubles are sufficiently annoying and disruptive. When the trouble recurs within a short time frame, customers are even more dissatisfied. This measurement, when gathered for both the ILEC and CLEC, can establish whether or not CLECs are competitively disadvantaged (vis-à-vis the ILEC) as a result of experiencing more lingering customer troubles after the first repair attempt. Differences in this measure may indicate that the CLEC is receiving inferior maintenance support in the initial resolution of troubles or that ILEC-supplied network components are inferior.
<b>Measurement Methodology:</b>	<p><b>Repeat Trouble Rate = (Count of Trouble Reports Where More Than One Trouble Report Was Logged for the Same Service Access Line Within a Continuous 30 Day Period) / (Number of Reports in the Report Period) x 100</b></p> <p><b>For CLEC Results:</b> The repeat trouble rate measure is computed by accumulating the number of instances where a trouble ticket is submitted by a CLEC to the ILEC for a service arrangement that had at least one prior trouble ticket any time in the 30 calendar days preceding the creation of the current trouble ticket. The number of repeat troubles are accumulated for the reporting period by service type and trouble type. The count of repeat troubles, by service type, is divided by the count of initial trouble reports (by service type) received during the report period.</p>

# Service Quality Measurements

## Measurement Detail

<p><b>For ILEC Results:</b> Same computation as for CLECs.</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"> <li>• Unbundled loops or UNE combinations involving and unbundled loops are considered a "service access line".</li> <li>• A trouble is "resolved" when the ILEC issues notice to the CLEC that the Customer's service is restored to normal operating parameters.</li> <li>• The "same service arrangement" means a trouble report being reported for the same telephone number or the same circuit identifier.</li> <li>• The trouble resolution need not be identical between the repeated reports for the incident to be counted as a repeated trouble.</li> </ul>	
<p><b>Reporting Dimensions:</b></p> <ul style="list-style-type: none"> <li>• Service Type (See Appendix A)</li> <li>• Company</li> <li>• Trouble Type</li> <li>• Geographic Scope</li> </ul>	<p><b>Excluded Situations:</b></p> <ul style="list-style-type: none"> <li>• Trouble tickets that are canceled at the CLEC request</li> <li>• ILEC trouble reports associated with administrative service</li> <li>• Instances where the CLEC or an ILEC customer requests that a ticket be "held open" for monitoring.</li> <li>• Subsequent trouble report(s) on a maintenance ticket that has (have) not been reported as resolved (or closed)</li> <li>• Trouble tickets created for tracking and/or monitoring requests for clarifying information (e.g., confirmation of customer ownership from CLEC support centers)</li> <li>• Tickets used to track referrals of misdirected calls.</li> </ul>
<p><b>Data Retained Relating To CLEC Experience:</b></p> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• CLEC Ticket #</li> <li>• Ticket Submission Time</li> <li>• Ticket Submission Date</li> <li>• Trouble Resolution Time</li> <li>• Trouble Resolution Date</li> <li>• Service Type</li> <li>• WTN or CKTID (a unique identifier for elements combined in a service configuration)</li> <li>• Trouble Type</li> <li>• Geographic Scope</li> </ul>	<p><b>Data Retained Relating To ILEC Performance:</b></p> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• % repeat trouble</li> <li>• Service Type</li> <li>• Trouble Type</li> <li>• Geographic Scope</li> <li>• Count of Troubles</li> <li>• Count of Repeat Troubles</li> </ul>
<p><b>Performance Standard in Absence of ILEC Results</b></p>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• Less than 1% of trouble reports, by service type, experience a repeat report, regardless of the trouble disposition, within a 30-day period.</li> </ul>

# Service Quality Measurements

## Measurement Detail

<b>Function:</b>  <b>Business Implications:</b>	<b>Frequency of Troubles</b>  Customers demand high quality service from their supplier, and differentials in supplier performance are quickly recognized throughout the market place. Poor performance is difficult to overcome and may require lengthy periods of sustained superb performance in order to re-establish a product image that has been tarnished. When measured for both the ILEC and CLEC and compared, this measure can be used to establish that CLECs are not competitively disadvantaged, compared to the ILEC, as a result of experiencing more frequent trouble reports. Disparity in this measure may indicate differences in the underlying quality of the network components supplied.
<b>Measurement Methodology:</b>	<p><b>Trouble Rate = (Count of Initial &amp; Repeated Trouble Reports in the Current Period) / (Number of Service Access Line in Service at End of the Report Period) x 100</b></p> <p><b>For CLEC Results:</b> The frequency of trouble metric is computed by accumulating, by standard service grouping and disposition and cause, the total number of maintenance tickets logged by a CLEC (with the ILEC) during the reporting period. The resulting number of tickets for each trouble type is accumulated within each standard service grouping, and trouble type is divided by the total number of "service access lines" existing for the CLEC at the end of the report period</p> <p><b>For ILEC Results:</b> Same calculation as for the CLEC with the clarifications provided below.</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"> <li>• This measure is frequently a minimum service standard required by state commissions for monitoring ILEC performance..</li> <li>• Unbundled loops or UNE combinations involving unbundled loops would be counted as a "service access line."</li> <li>• A trouble is "resolved" when the ILEC issues notice to the CLEC that the customer's service is restored to normal operating parameters.</li> <li>• See the "Time to Restore" measurement for a discussion of the ILEC equivalent of "trouble tickets" and "trouble logging".</li> </ul> <p><b>% Troubles Within 30 Days of Installations and Other Order Activity = (Total Number of Trouble Tickets Associated With Lines That Had Service Order Activity Within 30 Days of the Trouble Report)/(Total Number of Orders Completed in the Report Period.</b></p> <p><b>For CLEC Results:</b> The results are computed by accumulating the number of trouble tickets submitted by a CLEC to the ILEC for a service arrangement that had at least one install or service order activity within the 30 calendar days preceding the creation of the current trouble ticket. The count of troubles is divided by the count of service-affecting orders completed by the ILEC for the CLEC during the report period.</p> <p>Non-parity results for % Trouble Rate within 30 Days of Install and Other Order Activity may require further reporting to determine root cause issues. For instance, reports on whether facilities provided on new installations tested to industry standard per interconnection contract, tariff or regulatory requirements may be required if results indicate a poorer performance of facilities and supporting network equipment provided to CLECs. ILECs also may need to cooperate with CLECs on comparative mechanized line testing (through respective ILEC and CLEC switches) of the transmission quality of ILEC loops versus CLEC unbundled loops obtained from the</p>

# Service Quality Measurements

## Measurement Detail

<p>ILEC. Reporting dimensions of copper versus fiber deployment may show that CLEC install troubles result from a disparity in use of underlying transmission media for install of ILEC vs. CLEC facilities. The broadening of the measure to include more than just new installs will detect new service activations (hunt group changes, other feature additions) that cause troubles versus the quality of the transmission medium.</p> <p><b>For ILEC Results:</b> Calculations are similar to those for CLECs.</p>	
<p><b>Reporting Dimensions:</b></p> <ul style="list-style-type: none"> <li>• Standard Service Groupings (See Appendix A)</li> <li>• Company</li> <li>• Trouble Type</li> <li>• Geographic Scope</li> </ul>	<p><b>Excluded Situations:</b></p> <ul style="list-style-type: none"> <li>• Trouble tickets that are canceled at the CLEC request</li> <li>• ILEC trouble reports associated with administrative service</li> <li>• Instances where the CLEC or an ILEC customer requests a ticket be "held open" for monitoring</li> <li>• Trouble tickets created for tracking and/or monitoring requests for clarifying information (e.g., confirmation of customer ownership from CLEC support centers)</li> <li>• Tickets used to track referrals of misdirected calls.</li> </ul>
<p><b>Data Retained Relating To CLEC Experience:</b></p> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• CLEC Ticket #</li> <li>• Ticket Submission Time</li> <li>• Ticket Submission Date</li> <li>• Trouble Resolution Time</li> <li>• Trouble Resolution Date</li> <li>• Service Type</li> <li>• WTN or CKTID (a unique identifier for elements combined in a service configuration)</li> <li>• Trouble Type</li> <li>• Geographic Scope</li> </ul>	<p><b>Data Retained Relating To ILEC Performance:</b></p> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Service Type</li> <li>• Trouble Type</li> <li>• Geographic Scope</li> <li>• Number of Tickets</li> <li>• Number of Service Access Lines</li> </ul>
<p><b>Performance Standard in Absence of ILEC Results</b></p>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• Less than 0.5% of lines, by service type, regardless of disposition and cause, experience a trouble in a report period for both the "trouble rate" and "percent troubles on new installations and order activity measures."</li> </ul>

<p><b>Function:</b></p>	<p><b>Estimated Time To Restore Met</b></p>
<p><b>Business Implications:</b></p>	<p>When customers experience trouble on working services, they naturally expect the services to be restored within the time frame promised. When such commitments are not fulfilled, an already unsatisfactory condition, in the customer's eyes, becomes even worse. When this measure is collected for the ILEC and CLEC and then compared, it can be used to establish that CLECs are receiving equally reliable (as</p>

# Service Quality Measurements

## Measurement Detail

### Measurement Methodology:

compared to the ILEC operations) estimates of the time required to complete service repairs.

**% Customer Troubles Resolved Within Estimate = (Count of Customer Troubles Resolved By The Quoted Resolution Time and Date) / (Count of Customer Troubles Tickets Closed) x 100**

**For CLEC Results:** The computation of the measure is as follows: The quoted repair completion date and time is compared to the actual repair date and time (ticket closure as defined in Time to Restore metric). In each instance where the actual repair date and time is on or before the initially provided estimated or quoted date and time to restore, the count of "troubles resolved within estimate" is incremented by one for the relevant "service type" and "trouble type." The resulting count is divided by the total number of troubles resolved (for the consistent service and trouble type), for the report period, in all instances where an estimated interval was provided or a standard interval existed.

**For ILEC Results:** Same calculation as for CLEC.

### Other Clarifications and Qualification:

The ILEC analog for this measure is derived by comparing the actual date and time of ILEC trouble ticket closure compared to the projected trouble clearance date and time established through the ILEC agent's on-line interaction with the ILEC's work management system, regardless of whether or not the ILEC currently quotes this information to its retail customer.

- See the "Time To Restore" measurement for discussion of analogous ILEC maintenance activities (e.g., trouble resolution).
- The "quoted" or "estimated" time to restore is the actual scheduled time projection returned by the ILEC work management system or the standardized repair interval that the ILEC uses for its own operations when equivalent service arrangements are involved.
- A trouble is "resolved" when the ILEC issues notice to the CLEC that the customer's service is restored to normal operating parameters.
- If the ILEC supplies only the estimated repair interval, then the estimated date and time of repair is determined by adding the repair interval to the date and time that the CLEC logged the repair request with the ILEC.

### Reporting Dimensions:

- Company
- Service Type (See Appendix A)
- Trouble Type
- Geographic Scope

### Excluded Situations:

- Trouble tickets that are canceled at the CLEC request
- ILEC trouble reports associated with administrative service
- Instances where the CLEC or an ILEC customer requests a ticket be "held open" for monitoring
- Trouble tickets created for tracking and/or monitoring requests for clarifying information (e.g., confirmation of customer ownership from CLEC support centers).
- Tickets used to track referrals of misdirected calls.

## Service Quality Measurements

### Measurement Detail

Data Retained Relating To CLEC Experience:		Data Retained Relating To ILEC Performance:	
<ul style="list-style-type: none"> <li>• Report Month</li> <li>• CLEC Ticket #</li> <li>• Ticket Submission Time</li> <li>• Ticket Submission Date</li> <li>• Trouble Resolution Time</li> <li>• Trouble Resolution Date</li> <li>• Service Type</li> <li>• WTN or CKTID (a unique identifier for elements combined in a service configuration)</li> <li>• Trouble Type</li> <li>• Geographic Scope</li> </ul>		<ul style="list-style-type: none"> <li>• Report Month</li> <li>• Service Type</li> <li>• Trouble Type</li> <li>• Number of Troubles Resolved Within Estimate</li> <li>• Number of Troubles Resolved</li> <li>• Geographic Scope</li> </ul>	
<b>Performance Standard in Absence of ILEC Results</b>		<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• Greater than 99% of a maintenance problems, by service type and regardless of trouble type, are resolved by the quoted or estimated date and time of repair.</li> </ul>	

# Service Quality Measurements

## Measurement Detail

### General (GE)

<b>Function:</b>	<b>Systems Availability</b>
<b>Business Implications:</b>	Access to essential business functionality, supported by the ILEC's OSS, is absolutely critical to CLEC operations. This measure monitors whether OSS functionality is at least as accessible to the CLEC as it is to the ILEC.
<b>Measurement Methodology:</b>	<p><b>% System Availability = [(Hours Functionality is Available to CLECs During Report Period) / ( Number of Hours Functionality was Scheduled to be Available During the Period)] x 100</b></p> <p><b>For CLEC Results:</b> The total "number of hours functionality was scheduled to be available" is the cumulative number of hours (by date and time on a 24-hour clock) over which the ILEC planned to offer and support CLEC access to ILEC OSS functionality during the reporting period. The ILEC must provide a minimum advance notice of one reporting period regarding availability plans and such plans must be interface-specific. If scheduled availability is not provided with at least one report period's advance notice, then the default availability for the subsequent reporting period will be seven days per week, 24 hours per day.</p> <p>"Hours Functionality is Available" is the actual number of hours, during scheduled available time, that the ILEC gateway or interface is capable of accepting CLEC transactions or data files for processing in the gateway / interface and supporting OSS.</p> <p>The actual time available is divided by the scheduled time available and then multiplied by 100 to produce the "% system availability" measure. The "% system availability" measure is required for each unique interface type offered by the ILEC .</p> <p><b>For ILEC Results:</b> Each OSS of the ILEC that is employed in the support of CLEC operations must first be identified by supported functional area (e.g., pre-ordering, ordering and provisioning, repair and maintenance and billing) with such mapping disclosed to the CLECs. The "available time" and "scheduled available time" is gathered for each of the identified ILEC OSS during the report period. The OSS function availability is computed based upon the weighted average availability of the subtending support OSS. That is, the available time for each OSS supporting a functional area is accumulated over the report period and then divided by the summation of the scheduled available time for those same supporting OSS.</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"> <li>• The ILEC analogs for this performance measure are the internal measures of system downtime (or up time) typically established between the ILEC Systems Management Organization and the client organizations.</li> <li>• OSS scheduled and available time may be utilized in the computation of more than one functional area.</li> <li>• Parity exists if the CLEC "% system availability" <math>\geq</math> ILEC function availability for the functionality accessed by the CLEC.</li> <li>• "Capable of accepting" must have a meaning consistent with the ILEC definition down time, whether planned or unplanned, for internal ILEC systems having a comparable potential for customer impact.</li> <li>• Time is measured in hours and tenths of hours rounded to the nearest tenth of an hour.</li> </ul>

## Service Quality Measurements

### Measurement Detail

Reporting Dimensions:		Excluded Situations:	
<ul style="list-style-type: none"> <li>Company</li> <li>Interface type offered for each functional area (See Appendix A)</li> <li>Business Period (8:00AM to 8:00PM local time versus 8:00PM to 8:00AM , weekends and holidays)</li> </ul>		<ul style="list-style-type: none"> <li>None</li> </ul>	
Data Retained Relating To CLEC Experience:		Data Retained Relating To ILEC Performance:	
<ul style="list-style-type: none"> <li>Report Month</li> <li>Interface Type (Identifies each unique interface available to CLECs)</li> <li>Business Period</li> <li>Scheduled Hour Available</li> <li>Actual Hours Available</li> </ul>		<ul style="list-style-type: none"> <li>Report Month</li> <li>Functionality Identification</li> <li>Business Period</li> <li>% Availability of Functionality</li> </ul>	
<b>Performance Standard in Absence of ILEC Results</b>		<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>Less than 0.1% of unplanned down time, by interface type, during either business period.</li> </ul>	

<b>Function:</b>	<b>Center Responsiveness</b>
<b>Business Implications:</b>	When CLECs experience operational problems dealing with ILEC processes or interfaces, prompt responses by ILEC support centers are required to ensure that the CLEC customers are not adversely affected. Any delay in responding to CLEC center requests for support (e.g., request for a vanity telephone number) will, in turn, adversely impact the CLEC retail customer who may be holding on-line with the CLEC customer service agent. This measure monitors the ILEC's handling of support calls from CLECs to determine if responsiveness is at parity with the service the ILEC provides its retail customers seeking assistance (e.g., calls to the business office of the ILEC or call the ILEC to report service repair issues)..
<b>Measurement Methodology</b>	<p><b>Mean Time to Answer Calls</b> = <math>\Sigma [(Date \text{ and Time of Call Answer}) - (Date \text{ and Time of Call Receipt})] / (Total \text{ Calls Answered by Center})</math></p> <p><b>Call Abandonment Rate</b> = <math>(Count \text{ of Calls Terminated Before Answer During the Reporting Period}) / (Count \text{ of All Calls Placed in Queue During the Reporting Period})</math></p> <p><b>For CLEC Results:</b> Speed of answer (mean time to answer calls) and call abandonment rates are monitored through the call management technology utilized to distribute calls to ILEC agents supporting CLEC activities (i.e., call receipt personnel staffing ILEC support centers intended for CLEC use). Results for each measure are to be provided separately for each center handling CLEC inquiries. If centers deployed by the ILEC support multiple functions (e.g., both maintenance and provisioning) then the results for each function supported should be separately reported.</p> <p><u>Speed of Answer</u> is determined by measuring and accumulating the elapsed time from the entry of a CLEC call into the ILEC call management system until the CLEC call</p>

# Service Quality Measurements

## Measurement Detail

is transferred to the ILEC personnel assigned to handling CLEC calls for assistance. The elapsed time is measured in seconds and tenths of seconds rounded to the nearest tenth of a second. The accumulated elapsed time is divided by the count of calls transferred to ILEC agents for accuracy.

The Call Abandonment Rate is based on the number of calls received by the call distribution system of the ILEC center for the reporting period, regardless whether the call actually is transferred to ILEC personnel for processing. In addition, a count is accumulated of all calls that are subsequently terminated by the calling party or dropped due to equipment failure before transfer to the service agent for processing. The accumulated count of calls abandoned (terminated) is divided by the total count of calls received at the monitored center.

### For ILEC Results:

Speed of Answer, as it relates to the ILEC, will be measured in an identical manner as described for the CLEC. The results for the ILEC business office operations and its repair bureau operations should be separately accumulated, computed and retained. If further distinctions are made or more discrete tracking is performed within the ILEC call receipt centers (e.g., by business and residence), then results should be reported at the lowest possible level of detail. Where call receipt for such operations are commingled and inseparable, then only a single result for each measure will be generated and serve as the comparative result for both the CLEC repair support and the CLEC provisioning support results.

### Other Clarifications and Qualification:

- Speed of Answer minimum service standards, established in many states for business office, maintenance center, and/or operator services represent a similar ILEC measure and are derived from identical data (although the result displayed may be in comparison to a pre-established standard performance minimum).
- For ILEC and CLEC calls, an ILEC Agent answering and placing the caller on hold does not stop timing for purposes of the speed of answer interval.
- An interactive voice response (IVR) unit does not stop the timing for purposes of the speed of answer interval. For a call to be considered answered, the live ILEC Agent must handle the CLEC request.
- Results may be reported for the CLEC industry in aggregate to the extent that separate carrier-specific support centers are not provided. If separate centers are provided (either for an individual CLEC or a group of CLECs) then results should be gathered and supplied for each center and reported to the CLEC(s) based upon the center providing the specific CLEC's support.
- If the ILEC call management technology cannot measure speed of answer on a call-specific basis, then an alternate methodology that simulates speed of answer based upon the average time for component parts of the call (e.g., queue to IVR + IVR to queue + queue to agent answer) can be utilized by mutual consent of the ILEC and CLECs.

### Reporting Dimensions:

- Support Center Type (i.e., Center supporting CLEC maintenance, Center supporting CLEC provisioning, ILEC Center supporting retail customer maintenance calls, ILEC Center supporting business office inquiries)

### Excluded Situations:

- None

# Service Quality Measurements

## Measurement Detail

Data Retained Relating To CLEC Experience:		Data Retained Relating To ILEC Performance:	
<ul style="list-style-type: none"> <li>• Month</li> <li>• Center Identifier</li> <li>• Center Type</li> <li>• Mean Speed of Answer</li> <li>• Standard Error for Mean Speed of Answer</li> <li>• Count of Calls Answered</li> <li>• Count of Calls Abandoned</li> </ul>		<ul style="list-style-type: none"> <li>• Month</li> <li>• Center Identifier</li> <li>• Center Type</li> <li>• Mean Speed of Answer</li> <li>• Standard Error for Mean Speed of Answer</li> <li>• Count of Calls Answered</li> <li>• Count of Calls Abandoned</li> </ul>	
<b>Performance Standard in Absence of ILEC Results:</b>		<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC's operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• Greater than 95% of calls, by center, are answered within 20 seconds.</li> <li>• All calls are answered within 30 seconds.</li> </ul>	

<b>Function:</b>	<b>Average Response Interval for Real-time OSS Queries</b>
<b>Business Implications:</b>	<p>As an initial step of establishing service, the customer service agent must determine such basic facts as availability of desired features, service delivery intervals, telephone numbers to be assigned, the customer's current products and features, qualification of the customer's loop for advanced digital services, and/or the validity of the street address. Likewise, maintenance customer service agents also must obtain real-time information in order to log customer troubles. In preordering and maintenance operations, this type of information is gathered from supporting OSS while the customer (or potential customer) is on the telephone with the customer service agent. Because pre-ordering activities are the first tangible contact a customer may have with a CLEC and because customers already may be dissatisfied when they report a trouble, it is critical that the CLEC be perceived as equally competent, knowledgeable and fast as and ILEC customer service agent. This measure is designed to monitor the time required for CLECs to obtain the pre-ordering and maintenance information necessary to establish and modify service and to log trouble reports. Comparisons to ILEC results indicate whether a CLEC has an equal opportunity to deliver a comparable customer experience when a retail customer calls the CLEC with a service inquiry.</p>
<b>Measurement Methodology:</b>	<p><b>Average Response Interval = <math>\Sigma[(\text{Query Response Date \&amp; Time}) - (\text{Query Submission Date \&amp; Time})] / (\text{Number of Queries Submitted in Reporting Period})</math></b></p> <p><b>For CLEC Results:</b> The response interval for each query is determined by computing the elapsed time from the ILEC receipt of a query from the CLEC, whether or not syntactically correct, to the time the ILEC returns the requested data (or reject notification) to the CLEC. Elapsed time is accumulated for each major query or transaction type, consistent with the specified reporting dimension, and then divided by the associated total number of queries received by the ILEC during the reporting period.</p> <p><b>For ILEC Results:</b> The ILEC computation is identical to that for the CLEC with the clarifications noted below.</p>

# Service Quality Measurements

## Measurement Detail

<b>Other Clarifications and Qualification:</b> <ul style="list-style-type: none"> <li>The elapsed time for an ILEC query is measured from the point in time when the ILEC customer service agent submits the request for identical or similar information into the ILEC OSS until the time when the ILEC OSS returns the requested information to the ILEC customer service agent.</li> <li>As additional pre-ordering functionality is established by the industry, for example with respect to unbundled network elements, the reporting dimensions may be expanded.</li> <li>Elapsed time is measured in seconds and tenths of seconds rounded to the nearest tenth of a second.</li> <li>Elapsed time is to be measured through automated rather than manual monitoring and logging.</li> <li>The ILEC service agent entry of a request for pre-ordering or repair information (to the ILEC OSS) is considered to be the equivalent of the ILEC receipt of a query from the CLEC.</li> <li>The ILEC OSS return of information to the ILEC customer service agent, whether in hard copy or by display on a terminal, is considered equivalent to the return of requested information to the CLEC.</li> </ul>	
<b>Reporting Dimensions:</b> <ul style="list-style-type: none"> <li>Company</li> <li>Interface Type</li> <li>Pre-Ordering Query Types (See Appendix A)</li> <li>Maintenance Query Types (See Appendix A)</li> </ul>	<b>Excluded Situations:</b> <ul style="list-style-type: none"> <li>None</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b> <ul style="list-style-type: none"> <li>Report Month</li> <li>Interface Type (specific to pre-ordering or maintenance and repair)</li> <li>Query Identifier (e.g., unique tracking number)</li> <li>Query Receipt Date by ILEC</li> <li>Query Receipt Time by ILEC</li> <li>Query Type (per reporting dimension)</li> <li>Response Return Date</li> <li>Response Return Time</li> </ul>	<b>Data Retained Relating To ILEC Performance:</b> <ul style="list-style-type: none"> <li>Report Month</li> <li>Interface Type</li> <li>Query Type (per reporting dimension)</li> <li>Mean response interval</li> <li>Query Count</li> <li>Standard error of the mean response interval</li> </ul>
<b>Performance Standard in Absence of ILEC Results</b>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation, then result(s) related to the CLEC operation should meet or exceed the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>Other than a query requesting 30 or more telephone numbers, the response interval will be less than or equal 2 seconds for 98% of the CLEC's queries received by the ILEC during the reporting period and no query will take longer than 5 seconds.</li> <li>For queries requesting 30 or more telephone numbers, the response interval is never to exceed two hours.</li> </ul>

# Service Quality Measurements

## Measurement Detail

### Billing (BI)

<b>Function:</b>	<b>Timeliness Of Billing Record Delivery</b>
<b>Business Implications:</b>	Regardless of whether the billing is to retail customers or to exchange access service customers, ILEC delivery of billing records must provide CLECs with the opportunity to deliver bills in as timely a manner as the ILEC; otherwise artificial competitive advantage will be realized by the ILEC. The "mean time to provide recorded usage" and the "mean time to deliver invoices" metrics monitor this situation.
<b>Measurement Methodology</b>	<p><b>Mean Time to Provide Recorded Usage Records</b> = <math>\frac{\sum[(\text{Data Set Transmission Date}) - (\text{Date of Message Recording})]}{(\text{Count of All Messages Transmitted in Reporting Period})}</math></p> <p><b>Mean Time to Deliver Invoices</b> = <math>\frac{\sum[(\text{Invoice Transmission Date}) - (\text{Date of Scheduled Bill Cycle Close})]}{(\text{Count of Invoices Transmitted in Reporting Period})}</math></p> <p><b>For CLEC Results:</b></p> <p><u>Usage Records:</u> This measure captures the elapsed time between the recording of usage data generated either by CLEC retail customers or by CLEC access customers (by the AMA recording equipment associated with the ILEC switch) and the time when the data set, in a compliant format, is successfully transmitted to the CLEC. For each usage record, the calendar date and time of usage recording is compared to the calendar date and time of successful completion of data set transmission to the CLEC. The number of hours and tenths of hours elapsed between message recording and data set transmission will constitute the elapsed delivery time. The elapsed delivery time is accumulated for each usage record with the resulting total number of hours accumulated being divided by the number of complete usage records in all the data sets transmitted.</p> <p><u>Invoices:</u> This measure captures the elapsed number of days between the scheduled close of a Bill Cycle and the ILEC's successful transmission of the associated invoice to the CLEC. For each invoice, the calendar date of the scheduled close of Bill Cycle is compared to the calendar date that successful invoice transmission to the CLEC completes. The number of calendar days elapsed between scheduled Bill Cycle close and completion of invoice transmission will constitute the elapsed delivery time. The elapsed delivery time is accumulated for each invoice with the resulting total number of days accumulated being divided by the number of complete invoices sent in the reporting period.</p> <p><b>For ILEC Results:</b> Identical computations are made for the ILEC with the clarifications provided below.</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"> <li>The elapsed time for delivery of ILEC usage records is measured from the time of message recording, as captured on the ILEC's AMA tape, to the time the AMA tape is converted to billing format (EMR format or equivalent).</li> <li>The elapsed time for ILEC invoice delivery is measured from the scheduled close date of the retail customer bill cycle to the production of the customer bill in a format appropriate for delivery to retail customers regardless whether such a distribution occurs immediately.</li> </ul>

# Service Quality Measurements

## Measurement Detail

<ul style="list-style-type: none"> <li>Mean time to deliver usage records is to be reported separately for end user usage and access related usage.</li> </ul>	
<b>Reporting Dimensions:</b>	<b>Excluded Situations:</b>
<ul style="list-style-type: none"> <li>Company</li> </ul> Type of Record (end user or access) or Invoice (resale, UNE or interconnection services)	<ul style="list-style-type: none"> <li>Any usage records or invoices rejected due to formatting or content errors.</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b>	<b>Data Retained Relating To ILEC Performance:</b>
<ul style="list-style-type: none"> <li>Report Monthly</li> <li>Record Type or Invoice Type</li> <li>Mean Delivery Interval</li> <li>Standard Error of Delivery Interval</li> <li>Number of Messages or Invoices Delivered</li> </ul>	<ul style="list-style-type: none"> <li>Report Month</li> <li>Record Type or Invoice Type</li> <li>Mean Delivery Interval</li> <li>Standard Error of Delivery Interval</li> <li>Number of Messages or Invoices Delivered</li> </ul>
<b>Performance Standard in Absence of ILEC Results</b>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>For usage records, separately for access usage and end user usage:               <ol style="list-style-type: none"> <li>Greater than 99.9% records received within 24 hours of usage recording.</li> <li>All usage is received within 48 hours of usage recording.</li> </ol> </li> <li>Greater than 99.95% of total service resale invoices received within 10 calendar days of bill cycle close.</li> <li>Greater than 99.95% of wholesale (UNE) invoices received within 10 calendar days of bill cycle close.</li> </ul>

<b>Function:</b>	<b>Accuracy of Billing Records</b>
<b>Business Implications:</b>	<p>The accuracy of billing records affects the accuracy of the billing ultimately delivered to local service customers, whether retail local service or exchange access service customers. Billing for the elements from which CLEC services are constructed must be validated to assure that only correct charges are paid. This validation is necessary to assure that the cost structure for services is not inflated. Furthermore, charges such as "time and material" related charges may be on the invoice and need to be promptly passed on to customers (by CLECs) to avoid dissatisfaction regarding the timeliness of CLEC billing. Prompt billing of such charges also minimizes customer inquiries on late billing. Fair competition requires that the accuracy of billing records (both usage and invoices) delivered by the ILEC to the CLEC must provide CLECs with the opportunity to deliver bills at least as accurate as those delivered by the ILEC. Producing and comparing this measurement result for both the ILEC and CLEC allows a determination as to whether or not parity exists.</p>
<b>Measurement Methodology</b>	<p><b>Invoice Accuracy = [(Number of Invoices Delivered in the Reporting Period that Have Complete Information, Reflect Accurate Calculations and are Properly Formatted) / Total Number of Invoices Issued in the Reporting Period] x 100</b></p> <p><b>Usage Accuracy = [(Number of Usage Records Delivered in the Reporting Period That Reflected Complete Information Content and Proper Formatting) / (Total Number of Usage Records Transmitted)] x 100</b></p> <p><b>For CLEC Results:</b> The completeness of content, accuracy of information and conformance of formatting will be determined based upon the terms of the individual CLEC interconnection agreements with the ILECs. The ILEC will establish a quality</p>

# Service Quality Measurements

## Measurement Detail

	<p>control process that is disclosed to CLECs and that is no less rigorous than the most rigorous quality monitoring established in the ILEC billing service contracts for long distance service providers. The quality monitoring process must be disclosed in advance and process auditing must be permitted. The records and invoices delivered by the ILEC must simultaneously meet the standards relating to content, accuracy and formatting in order to be counted as accurate. Each of the above measurements, is expressed as a ratio (expressed as a percentage) of accurate records (or invoices) to the total records (or invoices) delivered.</p> <p><b>For ILEC Results:</b> The computation for the ILEC is identical to that described for the CLEC. The usage accuracy determination is based upon comparison of the usage records, following format conversion to the EMR (or equivalent) format as compared to the internally established content and formatting requirements. Likewise, the accuracy measure for invoice delivery will be based upon a statistically reliable comparison of ILEC invoices to the content, calculation methodology and formatting standards of the ILEC. Separate comparisons are to be made for retail service invoices and access invoices with the results compared to wholesale (total service resale) and UNE invoices, respectively.</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"><li>• The usage accuracy measure identified here is similar to the type of measures that ILECs commonly institute in service contracts with long distance service suppliers who use ILEC billing services.</li><li>• The wholesale invoice accuracy identified here is analogous to the measures contained within the Billing Quality Assurance Programs that the ILECs have with interchange carriers for monitoring access billing quality. If a sampling process is used to monitor accuracy, then the study results must be reconfirmed no less than quarterly.</li></ul>	
	<p><b>Reporting Dimensions:</b></p> <ul style="list-style-type: none"><li>• Company</li><li>• Type of Record (end user or access) or Invoice (resale, UNE or interconnection services)</li></ul>	<p><b>Excluded Situations:</b></p> <ul style="list-style-type: none"><li>• None</li></ul>
	<p><b>Data Retained Relating To CLEC Experience:</b></p> <ul style="list-style-type: none"><li>• Report Month</li><li>• Record Type or Invoice Type</li><li>• Number of Records With Errors</li><li>• Number of Records Delivered</li></ul>	<p><b>Data Retained Relating To ILEC Performance:</b></p> <ul style="list-style-type: none"><li>• Report Month</li><li>• Record Type or Invoice Type</li><li>• Number of Records With Errors</li><li>• Number of Records Created</li></ul>
	<p><b>Performance Standard in Absence of ILEC Results:</b></p>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"><li>• Greater than 98% of usage records transmitted, by usage type, reflect the agreed upon format and contain complete information.</li><li>• Greater than 98% of wholesale bills, by invoice type, are accurate.</li></ul>

# Service Quality Measurements

## Measurement Detail

### Operator Services,/Directory Assistance & Listings (OS, DA & DL)

<b>Function:</b>	<b>Speed To Answer/Review Period for Directory Listings</b>
<b>Business Implications:</b>	The speed of answer delivered to CLEC retail customers, when the ILEC provides Operator Services or Directory Services on behalf of the CLEC, must be no slower than the speed of answer that the ILEC delivers to its own retail customers of equivalent local services. The average amount of hold time that CLEC customers experience also must not be longer than it is for ILEC customers. In addition, CLECs must be provided the same opportunity to review directory listing updates to catch any errors before publication in white pages directories.
<b>Measurement Methodology:</b>	<p><b>Mean Time To Answer</b> = <math>[\Sigma(\text{Date and Time of Call Answer}) - (\text{Date and Time of Call Receipt})] / (\text{Total Calls Answered on Behalf of the CLECs in Reporting Period})</math></p> <p><b>Mean Time Allotted to Proof Listing Updates Before Publication</b> = <math>[(\text{Date \&amp; Time of Directory Publication Deadline}) - (\text{Date and Time Updates Available for Proofing})] / (\text{Total Number of Updates Provided for Proofing During Reporting Period})</math></p> <p><b>For CLEC Results:</b> Speed of answer is monitored through the call management technology used to distribute calls to ILEC agents supporting CLEC activities (i.e., call receipt personnel staffing Directory Assistance or Operator Service Positions).</p> <p><u>Speed of Answer</u> is determined by measuring and accumulating the elapsed time from the entry of a CLEC retail customer call into the ILEC call management system queue until the CLEC retail customer call is transferred to the ILEC personnel assigned to handling CLEC calls for assistance (whether DA or OS). The elapsed time is measured in seconds and tenths of seconds rounded to the nearest tenth of a second.</p> <p><u>Time Allotted To Proof Listing Updates</u> encompasses the amount of review time afforded to CLECs for the purposes of validating directory listings prior to directory publication. If electronic access permits a CLEC to view, on demand, its customers' listings as they will be published, then this measure is not necessary. An interface availability measurement, however, should be included within the reporting dimensions for the "General" OSS systems measurements. The directory proofing interval information should be captured and retained for each directory published. The interval is measured from the date and time the CLEC receives a final listing of customer-related information that will be contained within the ILEC's next directory publication to the final date and time for submission of changes to the listings provided.</p> <p><b>For ILEC Results:</b> Identical to process described for the CLEC with the clarification provided below.</p> <p><b>Other Clarifications and Qualifications:</b></p> <ul style="list-style-type: none"> <li>• The "speed to answer" measure is directly analogous to speed of answer minimum service standards established within many states.</li> <li>• Results must be reported separately for CLECs that use facilities-based interconnection, as customer calls to OS and DA will arrive at the operator center on unique facilities. For CLECs that use common facilities to deliver customer calls to the operator center, results may be reported for the CLEC industry in aggregate until the capability to measure specific CLEC results exists.</li> </ul>

# Service Quality Measurements

## Measurement Detail

<ul style="list-style-type: none"> <li>See the "Center Responsiveness" measurement for the treatment of situations where ILEC call management technology cannot measure speed of answer on a call basis from receipt to answer.</li> </ul>	
<b>Reporting Dimensions:</b> <ul style="list-style-type: none"> <li>Company</li> <li>Operator Services By Center</li> <li>Directory Assistance By Center</li> <li>Directory Listings By Directory</li> </ul> <p>Note: OS/DA Speed to Answer is to be CLEC-specific if technically feasible.</p>	<b>Excluded Situations:</b> <ul style="list-style-type: none"> <li>Call abandoned by customers prior to answer by the ILEC OS or DA operator</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b> <ul style="list-style-type: none"> <li>Month</li> <li>Type of Measurement (OS Calls, DA Calls or Directory Listing)</li> <li>Center Identifier (or Directory ID for DL)</li> <li>Mean Speed of Answer (OS &amp; DA only)</li> <li>Standard Error for Mean Speed of Answer (OS &amp; DA only)</li> <li>Number of Calls Answered (OS &amp; DA only)</li> <li>Directory Close Date (DL only)</li> <li>List Availability Date (DL only)</li> </ul>	<b>Data Retained Relating To ILEC Performance:</b> <ul style="list-style-type: none"> <li>Month</li> <li>Type of Measurement (OS Calls, DA calls or Directory Listings)</li> <li>Center Identifier (or Directory ID for DL)</li> <li>Mean Speed of Answer (OS &amp; DA only)</li> <li>Standard Error for Mean Speed of Answer (OS &amp; DA only)</li> <li>Standard Error for Mean Speed of Answer (OS &amp; DA only)</li> <li>Directory Close Date (DL only)</li> <li>Listing Availability Date (DL only)</li> </ul>
<b>Performance Standard in Absence of ILEC Results:</b>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>More than 90% of calls answered by a "live" agent, separately for OS and DA services, within 10 seconds.</li> <li>All calls answered by a Voice Response Unit, separately for OS and DA services, within 2 seconds.</li> <li>Directory Listing review time may be no more than 4 hours less than the ILEC's.</li> </ul>

# Service Quality Measurements

## Measurement Detail

### Network Performance (NP)

<b>Function:</b>	<b>Interconnect Traffic Engineering/Trunking Capacity</b>
<b>Business Implications:</b>	<p>When customers place calls, they expect that their calls will go through. Likewise customers also expect that other callers will be able to reach them without having their calls blocked. In order to ensure that CLEC customers do not experience greater blocking to and from their lines than ILEC customers do, it is necessary to measure and compare blocking rates for ILEC and CLEC trunk usage.</p> <p>Overall trunk blocking experienced by ILEC and CLEC customers must be measured because blockage on common trunks affects a greater percentage of CLEC total traffic than ILEC total traffic. The ILEC's greater build out of Direct End Office Trunking (DEOT), using common trunking mostly for overflow traffic from DEOTS, creates the disparity. Common trunks carry a greater percentage of CLEC traffic because of the CLECs' reliance on tandem interconnection as their networks are built out. The reliance not only is an economic choice based on 'start-up' traffic volumes, but also results from ILEC restrictions on direct end office connections.</p> <p>Blocking measurements, as recommended below, or any call completion comparisons for dedicated final interconnection trunks do not tell the whole story of network capacity. Timely delivery of interconnect trunks and augments based on CLEC traffic projections rather than current utilization is also significant to the capacity parity issue and is discussed further in the order completion interval section. To protect their customers and their reputations, CLECs keep blocking levels under control on dedicated trunks by holding up new off-net and on-net customer orders. Installing new customers before ILECs have provided adequate trunking capacity, in line with CLEC forecasts and actual business requirements, can degrade service to existing and new CLEC customers.</p>
<b>Measurement Methodology:</b>	<p><b>% Call Completion:</b> [(Total number of blocked call attempts (separate measures for inbound and outbound) during the busy hour)/Total number of call attempts during busy hour] x 100</p> <p><b>For CLEC Results:</b> For determining outbound call blocking, the number of CLEC customer call attempts, where the customer dials a valid telephone number, is accumulated for the reporting period. The number of blocked call attempts experienced by CLEC customers, where a call to a valid telephone number was not completed by the network because of ILEC-controlled capacity limitations or other ILEC network trouble, also is accumulated during the reporting period. At the end of the reporting period, the total number of blocked attempts is divided by the total number of attempts, and the ratio is expressed as a percentage. For inbound calling, the results will measure calls originating on the ILEC's network and blocked from terminating on the CLEC's network.</p> <p><b>For ILEC Results:</b> The approach is identical to that described for the CLEC, except that the network performance is measured only for representative ILEC service configurations.</p> <p><b>Other Clarifications and Qualifications:</b></p> <p>CLECs may agree to call completion reports in lieu of or in addition to blocking reports.</p>

# Service Quality Measurements

## Measurement Detail

Reporting Dimensions:		Excluded Situations:	
<ul style="list-style-type: none"> <li>• Trunk Capacity Type (DSO, DS1, DS3, etc.)</li> <li>• Dedicated Trunk Groups</li> <li>• Common Trunk Groups Where CLEC/LD Traffic Share Common ILEC Trunks.</li> <li>• Common Trunk Groups where CLEC traffic traverses a separate common network from ILEC traffic.</li> <li>• Availability of 7-digit call back-up to PSAP location</li> <li>• E911/911 Trunk Groups</li> <li>• OS/DA Trunk Groups</li> <li>• By Switch (Serving CLEC) for CLEC</li> <li>• By Switch (Serving CLEC) for ILEC</li> <li>• Company</li> <li>• Geographic Scope</li> </ul>		<ul style="list-style-type: none"> <li>• None.</li> </ul>	
Data Retained Relating To CLEC Experience:		Data Retained Relating To ILEC Performance:	
<ul style="list-style-type: none"> <li>• Report Month</li> <li>• By Switch (Serving CLEC) for CLEC</li> <li>• Trunk Capacity Type</li> <li>• Trunk Group Identifier</li> <li>• Geographic Identifier</li> <li>• Busy Hour and Day</li> <li>• Calls Attempted</li> <li>• Calls Blocked</li> </ul>		<ul style="list-style-type: none"> <li>• Report Month</li> <li>• By Switch (Serving CLEC) for ILEC</li> <li>• Trunk Capacity Type</li> <li>• Trunk Group Identifier</li> <li>• Geographic Identifier</li> <li>• Busy Hour and Day</li> <li>• Calls Attempted</li> <li>• Calls Blocked</li> </ul>	
<b>Performance Standard in Absence of ILEC Results:</b>		<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <p>Engineering Parameters:</p> <ul style="list-style-type: none"> <li>• Dedicated Trunk Groups: Not to exceed blocking standard of B.01</li> <li>• Common Trunk Groups:               <ol style="list-style-type: none"> <li>(1) Where CLEC/LD traffic share common ILEC trunks: No more than 1% of end offices may have more than 2% blockage a month based on the Erlang-B.01 scale.</li> <li>(2) Where CLEC traffic traverses a separate common network from ILEC traffic: No more than 2% of end offices may have more than 2% blocking.</li> </ol> </li> </ul>	

# Service Quality Measurements

## Measurement Detail

<b>Function:</b>  <b>Business Implications:</b>	<b>Reporting Network Outages</b>  Both CLECs and ILECs must be made aware of major network events in order to notify customers and regulatory agencies (e.g. E-911 agencies, FAA, and other key customer accounts).  To that end, the ILECs must provide the CLECs with timely and detailed information (pertaining to a network incident) to afford CLECs the opportunity to make prudent business decisions regarding management of their own customer base and networks. For example, the ILEC would inform the CLEC that the network incident was caused by a cable cut at a specified location.
<b>Measurement Methodology:</b>	<b>Mean Time to Notify CLEC = <math>\Sigma[(\text{Date and Time ILEC Notified CLEC network incident}) - (\text{Date and Time ILEC detected network incident})] / \text{Count of Network Incidents}</math>.</b>  <b>For CLEC Results:</b> The results will be based on the time it takes for the ILEC's Centralized Control Center to notify the CLEC and ILEC of a customer impacting network incident in equipment utilized by the CLEC. When the ILEC's Centralized Control Center becomes aware of the network incident, they must electronically notify both the ILEC and the CLEC.  The notification time for each outage will be measured in minutes and divided by the number of outages for the reporting period.  <b>For ILEC Results:</b> Same computation as for the CLEC.
<b>Reporting Dimensions:</b> <ul style="list-style-type: none"> <li>• Company</li> <li>• Type of Event - By each Reportable Incident Grouping (See Attachment A)</li> <li>• By Switch and Tandem</li> </ul>	<b>Excluded Situations:</b> <ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Type of Event</li> <li>• Meantime to notify CLEC</li> <li>• Number of Events</li> <li>• Geographic Scope Indicator</li> </ul>	<b>Data Retained Relating To ILEC Performance:</b> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Type of Event</li> <li>• Mean Time to Detect Event</li> <li>• Number of Events</li> <li>• Geographic Scope Indicator</li> </ul>
<b>Performance Standard in Absence of ILEC Results:</b>	If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete: <ul style="list-style-type: none"> <li>• Electronic Notification Procedures are required for real-time network incident reporting from ILEC to CLEC.</li> <li>• Manual reporting processes may be required until OSS Interfaces become operational.</li> </ul>

# Service Quality Measurements

## Measurement Detail

<b>Function:</b>	<b>Network Performance Parity</b>	
<b>Business Implications:</b>	The perceived quality of CLEC retail services, particularly when either ILEC services are resold or UNE combinations are employed, will be heavily influenced by the underlying quality of the ILEC network performance. Customers experience the network quality of the service provider each time services are used. This metric, when collected for both the CLEC and ILEC and then compared, will help show whether CLEC network performance is at least at parity with ILEC network performance.	
<b>Measurement Methodology</b>	<p><b>Network Performance Parity = <math>\Sigma(\text{Network Performance Parameter Result})/(\text{Number of Tests Conducted})</math></b></p> <p><b>For CLEC Results:</b> Based upon a random and statistically reliable (at a preset level) sample of network configurations employed by the CLEC, the network performance parameter (as indicated in the reporting dimension) is monitored based upon generally accepted testing procedures and the resulting parameter value(s) recorded. The measured values are accumulated across the sample base and the mean and associated variance computed.</p> <p><b>For ILEC Results:</b> The approach is identical to that described for the CLEC, except that the network performance is measured only for representative ILEC service configurations.</p>	
<b>Reporting Dimensions:</b>		<b>Excluded Situations:</b>
<ul style="list-style-type: none"> <li>• Transmission Quality (See Appendix A)</li> </ul>		<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b>		<b>Data Retained Relating To ILEC Performance:</b>
<ul style="list-style-type: none"> <li>• Report Month</li> <li>• Reporting Dimension</li> <li>• Mean Performance Result</li> <li>• Standard Error of Mean Performance</li> <li>• Number of Data Points</li> <li>• Geographic scope</li> </ul>		<ul style="list-style-type: none"> <li>• Report Month</li> <li>• Reporting Dimension</li> <li>• Mean Performance Result</li> <li>• Standard Error of Mean Performance</li> <li>• Number of Data Points</li> <li>• Geographic scope</li> </ul>
<b>Performance Standard in Absence of ILEC Results</b>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• Performance Standards in this area are yet to be published.</li> </ul>	

# Service Quality Measurements

## Measurement Detail

### Collocation Provisioning (CP)

<b>Function:</b>	<b>Collocation Provisioning</b>
<b>Business Implications:</b>	<p>CLECs need to receive timely responses describing the price and availability of collocation space and ontime provisioning of collocation arrangements. CLECs also need the timely offering of alternatives to physical collocation and virtual collocation.</p> <p>Where ILECs run out of physical collocation space, they may develop suitable space. CLECs also may prefer more cost-efficient alternatives that afford control over their own equipment and may seek alternative arrangements from ILECs. The speed at which these alternative arrangements (i.e. leasing GR-303 compliant access concentration equipment as an unbundled network element or backhauling to a neighboring central office) are offered and provided also is critical to CLECs obtaining a meaningful opportunity to compete in local markets.</p>
<b>Measurement Methodology:</b>	<p><b>Mean Time To Respond To Collocation Request</b> = <math>\Sigma [(Request\ Response\ Date) - Request\ Submission\ Date] / Count\ of\ Request\ Responses\ Issued</math></p> <p><b>Mean Time To Provide Collocation Arrangement</b> = <math>\Sigma [(Date\ \&amp;\ Time\ Collocation\ Arrangement\ is\ Complete) - (Date\ \&amp;\ Time\ Collocation\ Application\ Submitted)] / Number\ of\ Collocation\ Arrangements\ Completed</math></p> <p><b>% Due Dates Missed</b> = <math>(Number\ of\ Orders\ Not\ Completed\ By\ ILEC\ Committed\ Due\ Date) / Total\ Number\ of\ Orders\ Completed\ During\ the\ Reporting\ Period</math></p> <p><b>For CLEC Results:</b></p> <p><u>Mean Time to Respond to Collocation Request:</u> The response interval for each space request is determined by computing the elapsed time from the ILEC receipt of a collocation request (or inquiry) from the CLEC, to the time the ILEC returns the requested information or commitment to the CLEC. Elapsed time is accumulated for each type of collocation space request, and then divided by the associated total number of collocation requests received by the ILEC during the report period.</p> <p><u>Mean Time To Provide Collocation Arrangements:</u> The interval is the elapsed time from the ILEC's receipt of an order for collocation (from the CLEC) to the ILEC's return of a valid completion notification to the CLEC. Elapsed time for each order is then divided by the associated total number of collocation orders completed within the reporting period for each type of collocation. The measurement is similar to the Average Completion Interval for resold services and unbundled network element orders and could be reflected as a separate category of that measurement.</p> <p><u>% Due Dates Missed:</u> For each type of collocation, both the total numbers of orders completed within the reporting interval and the number of orders completed but missing the committed due date (as specified on the initial confirmation returned to the CLEC) are counted. The resulting count of orders completed later than the committed due date is divided by the total number of orders completed. The measurement is similar to the % Completed on Time for resold services and unbundled network element orders and could be reflected as a separate category within the % Completed on Time measurement.</p> <p><b>For ILEC Results:</b> The ILEC computation is identical to that for the CLEC for provision of collocations to ILEC affiliates. Largely, however, tariff and contract standards will be the benchmarks that ILECs must meet for a parity determination.</p>

# Service Quality Measurements

## Measurement Detail

	<p>Their vast number of end offices compared to CLECs' switch deployment make it difficult to develop the appropriate analog.</p> <p><b>Other Clarifications and Qualifications:</b></p> <ul style="list-style-type: none"> <li>• Elapsed time is measured in days and hours.</li> <li>• A response to the collocation request will only be considered to be "received" if it is a thorough and actionable plan (i.e., a simple "yes" or "no" is not sufficient).</li> <li>• Questions about the CLEC's collocation request also do not count as a "received response."</li> </ul>
<p><b>Reporting Dimensions:</b></p> <ul style="list-style-type: none"> <li>• Company</li> <li>• Type of Collocation</li> <li>• Geographic Scope</li> </ul>	<p><b>Excluded Situations:</b></p> <ul style="list-style-type: none"> <li>• CLEC cancellations or requested delays.</li> </ul>
<p><b>Data Retained Relating To CLEC Experience:</b></p> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Request Identifier (e.g., unique tracking number)</li> <li>• Date and Time of Request receipt by ILEC.</li> <li>• Request type (per reporting dimension)</li> <li>• Response Date and Time</li> <li>• Committed Delivery Date and Time</li> <li>• Actual Delivery Date and Time</li> <li>• Response Date and Time</li> <li>• Geographic Scope</li> </ul>	<p><b>Data Retained Relating To ILEC Performance:</b></p> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Request Identifier</li> <li>• Date and Time of Request Receipt by ILEC</li> <li>• Response Date and Time</li> <li>• Committed Delivery Date and Time</li> <li>• Actual Delivery Date and Time</li> <li>• Geographic scope</li> </ul>
<p><b>Performance Standard in Absence of ILEC Results</b></p>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• All responses must be provided in 5 business days unless contract/tariff interval is shorter.</li> <li>• All collocations must be provided within the applicable contract or tariff intervals.</li> <li>• No less than 98% of commitments must be met for Physical, Virtual and other alternative collocation offerings.</li> </ul>

# Service Quality Measurements

## Measurement Detail

### Database Updates (DU)

<b>Function:</b>	<b>Database Updates</b>
<b>Business Implications:</b>	<p>CLECs must rely on ILEC databases in order to provide accurate E911/911 services, directory listings, directory assistance, and operator services. ILECs currently control the updating of many essential databases, such as the Line Information Database (LIDB); directory listings, E911 Automatic Location Identifier (ALI), Master Street Address Guide (MSAG) and selective routing databases.</p> <p>In addition, accurate and timely loading of NXXs before the LERG (Local Exchange Routing Guide) effectiveness date is vital to CLEC customer's receiving calls from ILEC customers, and it is essential to ensure that customers are charged correctly for local and toll calls. Routing of CLEC's NXXs at the tandem and central office to the proper Public Safety Answering Point (PSAP) for emergency calls also is critical to E911/911 service.</p> <p>Disparity in timely and accurate updates of the above databases can lead to annoying, costly and possibly "life and death" situations for CLEC customers.</p>
<b>Measurement Methodology:</b>	<p><b>Average Update Interval</b> = <math>\Sigma [(Completion\ Date\ \&amp;\ Time\ of\ Database\ Update) - (Submission\ Date\ and\ Time\ of\ Database\ Change)] / Total\ Number\ of\ Updates\ Completed\ During\ Reporting\ Period</math></p> <p><b>% Update Accuracy</b> = <math>[Number\ of\ Updates\ Completed\ Without\ Error] / (Number\ Updates\ Completed) \times 100</math></p> <p><b>For CLEC Results:</b>  <b>Average Update Interval:</b> The actual update interval is determined for each update processed during the reporting period. It is the elapsed time from the ILEC receipt of a syntactically correct transaction from the CLEC to the ILEC's accurate completion of updating all databases affected by the CLEC activity. Elapsed time for each update is accumulated for each affected database (e.g., E911/911, LIDB, Directory and Directory Listings). The time required to update each database is accumulated and then divided by the associated total number of updates completed within the reporting period.</p> <p><b>% Update Accuracy:</b> For each update completed during the reporting period, the original update that the CLEC sent to the ILEC is compared to the Database following completion of the update by the ILEC. An update is "completed without error" if the database completely and accurately reflects the activity specified on the original and supplemental update (e.g., orders) submitted by the CLEC. Each Database (e.g., E911/911, LIDB, Directory and Directory Listings) should be separately tracked and reported.</p> <p><b>For ILEC Results:</b> The ILEC computation is identical to that for the CLEC with the clarifications noted below.</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"> <li>For LIDB, the elapsed time for an ILEC update is measured from the point in time when the ILEC's file maintenance process makes the LIDB update information available until the date and time reported by the ILEC that database updates are completed.</li> <li>Results for the CLECs are captured and reported at the update level by Reporting Dimension (see below).</li> </ul>

# Service Quality Measurements

## Measurement Detail

	<ul style="list-style-type: none"> <li>• The Completion Date is the date upon which the ILEC issues the Update Completion Notice to the CLEC.</li> <li>• If the CLEC initiates a supplement to the originally submitted update and the supplement reflects changes in customer requirements (rather than responding to ILEC initiated changes), then the update submission date and time will be the date and time of ILEC receipt of a syntactically correct update supplement. Update activities responding to ILEC initiated changes will not result in changes to the update submission date and time used for the purposes of computing the update completion interval.</li> <li>• Elapsed time is measured in hours and hundredths of hours rounded to the nearest tenth of an hour.</li> <li>• Because this should be a highly automated process, the accumulation of elapsed time continues through off-schedule, weekends and holidays; however, scheduled maintenance windows are excluded.</li> </ul>
<b>Reporting Dimensions:</b> <ul style="list-style-type: none"> <li>• Company</li> <li>• Database Type</li> </ul>	<b>Excluded Situations:</b> <ul style="list-style-type: none"> <li>• Updates Canceled by the CLEC</li> <li>• Initial update when supplemented by CLEC</li> <li>• ILEC updates associated with internal or administrative use of local services</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Database Type</li> <li>• Update Submission Date</li> <li>• Update Submission Time</li> <li>• Update Completion Date</li> <li>• Update Completion Time</li> <li>• Reporting Dimension</li> <li>• Geographic Scope</li> </ul>	<b>Data Retained Relating To ILEC Performance:</b> <ul style="list-style-type: none"> <li>• Report Month</li> <li>• Database Type</li> <li>• Mean Interval for Update</li> <li>• Standard Error of Mean</li> <li>• Number of Updates</li> <li>• Number of Updates With Errors</li> <li>• Geographic Scope</li> </ul>
<b>Performance Standard in Absence of ILEC Results:</b>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>• 99.99% completed in 24 hours or 100% completed by LERG effective date.</li> <li>• 99.99% accurate</li> </ul>

# Service Quality Measurements

## Measurement Detail

### Interconnection/Unbundled Elements and Combinations (IUE)

<b>Function:</b>	<b>Availability of Network Elements</b>
<b>Business Implications:</b>	As CLECs use individual elements and element combinations to deliver unique services, UNE functionality must operate properly to ensure that those elements support quality retail services. This measure monitors individual network elements or element combinations to ensure that CLECs have a meaningful opportunity to compete through access to and use of element (or combination) functionality.
<b>Measurement Methodology</b>	<p><b>Function Availability<sup>1</sup> = (Amount of Time<sup>2</sup> a Functionality is Useable<sup>1</sup> by a CLEC in a Specified Period)/(Total Time<sup>2</sup> Functionality Was Scheduled To Be Useable)</b></p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. These measurements may also be expressed in the negative, that is, in term of unavailability.</li> <li>2. In some instances, rather than time, the availability will be expressed in terms of transactions executed successfully compared to transactions attempted.</li> </ol> <p><b>For CLEC Results:</b> Availability will be measured for each unique UNE functionality (or combination of UNEs). The number of times that the functionality executes properly will be shown in comparison to the number of times that the execution of the functionality was requested or initiated. Availability can apply to both physical and logical (e.g., database) elements. Physical element availability (e.g., links to databases, dedicated transport, etc.) will typically be expressed as the percent of time that the functionality is useable compared to the total time in the period being observed. "Useable" means that, when monitored, the element indicates readiness to operate (e.g., an electrical (or equivalent) continuity is detected, expected signaling is returned, etc.). Logical element availability will typically be expressed in terms of the number of transactions successfully executed (e.g., successful database updates, success query responses) compared to the number of transactions attempted.</p> <p>Illustrative examples of availability measures are shown below</p> <ul style="list-style-type: none"> <li>• A-link: minutes unavailable per year</li> <li>• D-link: seconds unavailable per year</li> <li>• Databases: percentage of queries receiving a response</li> <li>• Databases: percentage of queries experiencing a return of unexpected values</li> </ul> <p><b>For ILEC Results:</b> Identical measurements are performed where the ILEC employs the same or reasonably comparable functionality. Where such analogs do not exist, the ILEC is expected to establish benchmark performance levels jointly with the CLEC requesting the functionality.</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"> <li>• The preceding list of elements is illustrative and is not to be considered exhaustive</li> <li>• ILEC failure to provide comparably timely performance when using comparable functionality constitutes discriminatory access. Where comparable functionality is not employed, failure to meet or exceed parameters negotiated with the CLEC also is discrimination.</li> <li>• For each element or element combination requested, where a retail analog is not identified, the ILEC is expected to establish both an availability measure and an availability standard (ILEC functional analog or benchmark) unless the CLEC waives its right for such a measure.</li> </ul>

# Service Quality Measurements

## Measurement Detail

<ul style="list-style-type: none"> <li>Typical databases for which standards are currently expected are AIN, LIDB and 800 Number.</li> </ul>	
<b>Reporting Dimensions:</b>	<b>Excluded Situations:</b>
<ul style="list-style-type: none"> <li>By unique UNE or UNE combinations requested by the CLECs</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b>	<b>Data Retained Relating To ILEC Performance:</b>
<ul style="list-style-type: none"> <li>Month</li> <li>Element or Element Combination Identification</li> <li>Result for Agreed Upon Availability Parameter</li> </ul>	<ul style="list-style-type: none"> <li>To Be Determined</li> </ul>
<b>Performance Standard in Absence of ILEC Results</b>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>Performance Standards in this area are yet to be published.</li> </ul>

<b>Function:</b>	<b>Performance of Network Elements</b>
<b>Business Implications:</b>	<p>As CLECs use individual elements (as well as element combinations) to deliver unique services, it is essential that the UNE functionality operates in a timely manner because of the crucial role played by such elements in providing quality retail services. This measure monitors individual network element (or element combinations) that do not have an apparent retail analog. CLECs must be afforded a meaningful opportunity to compete when element (or combination) functionality is utilized.</p>
<b>Measurement Methodology:</b>	<p><b>Timeliness of Element Performance = (Number of Times Functionality Executes Successfully Within the Established Timeliness Standard)/(Number of Times Execution of Functionality was Attempted)</b></p> <p><b>For CLEC Results:</b> Timeliness will be measured for each unique UNE (or combination of UNES) that delivers unique functionality. The number of times that the functionality executes properly within the established standard time frame will be accumulated and shown in comparison to the number of times that the execution of the functionality was requested or initiated.</p> <p>Illustrative examples of timeliness measures are shown below:</p> <ul style="list-style-type: none"> <li>Database: % transactions experiencing time-outs</li> <li>Post Dial Delay: % calls routed to CLEC OS platform within 2 seconds</li> </ul> <p><b>For ILEC Results:</b> Identical measurements are performed where the ILEC employs the same or reasonably comparable functionality. Where such analogs do not exist, the ILEC is expected to establish benchmark performance levels jointly with the CLEC requesting the functionality.</p> <p><b>Other Clarifications and Qualification:</b></p> <ul style="list-style-type: none"> <li>The preceding list of elements is illustrative and is not to be considered exhaustive</li> <li>ILEC failure to provide comparably timely performance when using comparable functionality constitutes discriminatory access. Where comparable functionality is not employed, failure to meet or exceed parameters negotiated with the CLEC also is discrimination.</li> </ul>

## Service Quality Measurements

### Measurement Detail

<ul style="list-style-type: none"> <li>For each element (or element combination) requested where a retail analog is not identified, the ILEC is expected to establish both a timeliness measure and a timeliness standard (ILEC functional analog or benchmark) jointly with the requesting CLEC unless that CLEC waives its right for such a measure.</li> <li>Typical databases for which standards are currently expected are AIN, LIDB and 800 Number.</li> <li>Comparisons of performance should be based upon the criteria for which the element was engineered. For example, if the element was engineered based upon average busy hour criteria, the comparison should be based upon the CLEC busy hour period (likewise for criteria such as busy day, busy season, or ten high days).</li> </ul>	
<b>Reporting Dimensions:</b>	<b>Excluded Situations:</b>
<ul style="list-style-type: none"> <li>By unique UNE or UNE combinations requested by the CLECs</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Data Retained Relating To CLEC Experience:</b>	<b>Data Retained Relating to ILEC Performance:</b>
<ul style="list-style-type: none"> <li>Month</li> <li>Element or Element Combination Identification</li> <li>Result for Agreed Upon Availability Parameter</li> </ul>	<ul style="list-style-type: none"> <li>To Be Determined</li> </ul>
<b>Performance Standard in Absence of ILEC Results:</b>	<p>If the ILEC does not deliver direct comparative results or the ILEC has not produced benchmark levels based upon a verifiable study of its own operation as agreed to with the CLEC, then result(s) related to the CLEC operation should be provided according to the following levels of performance in order to provide the CLEC with a meaningful opportunity to compete:</p> <ul style="list-style-type: none"> <li>Performance Standards in this area are yet to be published.</li> </ul>

# Service Quality Measurements

## Appendix A: Reporting Dimensions

### Appendix A: Reporting Dimensions

<b>Service Types:</b>	<ul style="list-style-type: none"> <li>• Resold Residence POTS</li> <li>• Resold Business POTS</li> <li>• Resold BRI ISDN</li> <li>• Resold PRI ISDN</li> <li>• Resold Centrex/Centrex-like</li> <li>• Resold Analog PBX trunks</li> <li>• Resold DID Trunks</li> <li>• Resold Voice-Grade Private Line</li> <li>• Resold DS1 Services</li> <li>• Resold DS3 Services</li> <li>• Resold &gt;DS3 Services</li> <li>• Other Resold Services</li> <li>• UNE Platform (at least DS0 loop + local switch + transport elements)</li> <li>• UNE Channelized DS1 (DS1 loop + multiplexing)</li> <li>• Unbundled or UNE-derived 8 dB Analog Loops</li> <li>• Unbundled or UNE-derived 2-wire Digital Loops</li> <li>• Unbundled or UNE-derived 4-wire Digital Loops</li> <li>• Unbundled or UNE-derived ADSL Loops</li> <li>• Unbundled or UNE-derived HDSL Loops</li> <li>• Unbundled or UNE-derived xDSL Loops</li> <li>• Other Unbundled or UNE-derived Loops</li> <li>• UNE Analog Switch Port (line side)</li> <li>• UNE BRI Capable Switch Port (line side)</li> <li>• UNE DS1 Switch Port (line side)</li> <li>• UNE PRI Switch Port (trunk side)</li> <li>• UNE DID-capable Switch Port (trunk side)</li> <li>• UNE Message Trunk Port</li> <li>• UNE Dedicated DS0 Transport</li> <li>• UNE Dedicated DS1 Transport</li> <li>• UNE Dedicated DS3 Transport</li> <li>• Interconnect Trunks (DS0s, DS1s and DS3s, Two-Way Trunking, Inbound Augments, separately)</li> <li>• Common Transport</li> <li>• ILNP</li> <li>• PNP</li> <li>• ILNP-to-LNP conversions</li> </ul>
<b>Standard Order Activities:</b>	<ul style="list-style-type: none"> <li>• New Service Installations</li> <li>• Service Migrations Without Changes</li> <li>• Service Migrations With Changes</li> <li>• Local Number Porting</li> <li>• Inside Move</li> <li>• Outside Move</li> <li>• Records Change</li> <li>• Feature Changes</li> <li>• Service Disconnects</li> <li>• Translation Disconnects</li> <li>• Standalone Directory Listing (DL)</li> <li>• Standalone Directory Assistance (DA) Listing</li> <li>• Standalone DL &amp; DA Activity</li> </ul>

# Service Quality Measurements

## Appendix A: Reporting Dimensions

<b>Pre-Ordering Query Types:</b>	<ul style="list-style-type: none"> <li>• Due Date Reservation (if separate transaction from Appointment Scheduling)</li> <li>• Feature Function Availability</li> <li>• Facility Availability (if separate transaction from Feature/Function Availability)</li> <li>• Qualification of Loops for Advanced Digital Services</li> <li>• Street Address Validation</li> <li>• Service Availability Information (if separate transaction from Feature/Function Availability)</li> <li>• Appointment Scheduling</li> <li>• Customer Service Records</li> <li>• Telephone Number</li> <li>• Rejected or Failed Queries (regardless of type)</li> </ul>
<b>Maintenance Query Types</b>	<ul style="list-style-type: none"> <li>• Create (or confirm logging of) a Maintenance Request</li> <li>• Obtain Status</li> <li>• Obtain Test Results</li> <li>• Cancel Request</li> <li>• Rejected or Failed Queries (regardless of type)</li> <li>• Clearance Notification</li> <li>• Closure Notification</li> </ul>
<b>Order Rejection Reason Codes</b>	<ul style="list-style-type: none"> <li>• Invalid Address</li> <li>• Address Errors</li> <li>• End User Name Doesn't Match ILEC Records</li> <li>• Incorrect Directory Assistance Listing/Due Date</li> <li>• Duplicate PON</li> <li>• Winback (Customer Returned to ILEC)</li> <li>• ILEC System Problem</li> <li>• TN Already Disconnected</li> </ul>
<b>Transmission Quality Parameter:</b>	<ul style="list-style-type: none"> <li>• Subscriber Loop Loss</li> <li>• Signal to Noise Ratio</li> <li>• Idle Channel Circuit Noise</li> <li>• Loop-Circuit Balance</li> <li>• Circuit Notched Noise</li> <li>• Attenuation Distortion</li> </ul>
<b>Collocation Provisioning Types:</b>	<ul style="list-style-type: none"> <li>• Physical within CO (space available at time of request)</li> <li>• Physical within CO (space created in response to request)</li> <li>• Physical outside of CO (space available at time of request)</li> <li>• Physical outside of CO (space created in response to request)</li> <li>• Virtual</li> <li>• Backhauling to neighboring CO</li> <li>• Access to GR-303 compatible concentration equipment (leased UNE alternative)</li> <li>• Other alternatives to physical</li> </ul>
<b>Databases and Switch Tables:</b>	<ul style="list-style-type: none"> <li>• E911/911 ALI, Selective Router</li> <li>• MSAG</li> <li>• LIDB</li> <li>• OS/DA</li> <li>• DL</li> <li>• NXX tables at CO for call completion and NXX routing</li> <li>• NXX tables at tandem for call completion and NXX routing</li> </ul>

# Service Quality Measurements

## Appendix A: Reporting Dimensions

### Reportable Network Incidents:

#### ***Switching (Local/Tandem):***

- Complete loss of call processing capability from a switch (host/remotes) lasting = > 2 minutes or longer.
- Network Incident (Loss of Dial Tone) affecting one thousand access lines.
- Media Interest: Any interruption or outage that may cause public or news media attention.

#### ***Transport:***

##### **EQUIPMENT AND/OR FACILITY FAILURES**

- Local (200 or more working pairs affected, causing loss of dial tone)
- Toll/EAS (Isolation of an entire exchange) > 2 minutes.
- Fiber (Any working fiber providing customer service that fails without protection) lasting > 2 Minutes.
- A transport equipment failure (E.G. DACS) > 2 minutes.

##### **BROADBAND**

- Frame Relay (A failure of one or more channelized T1 carrier systems or two or more non-channelized T1 carrier systems.
- ATM (A failure of one OC3 or two DS3s)
- SMDS (A failure of one DS3 or four T1s)
- Packet Switching (Any failure of an access module (AM) or resource module (RM))

##### **NARROWBAND**

- 5 T1 carrier systems (within a switch)
- Fiber (Any working fiber providing customer service that falls without protection)
- Media Interest: Any interruption or outage that may cause public or news media attention.

#### ***SS7:***

- Loss of mated pair of STP or SCP > 2 minutes
- Media Interest: Any interruption or outage that may cause public or news media attention

#### ***Trunking:***

- Loss of intra/interoffice calling lasting > 2 minutes. (E.G. Toll and/or EAS)
- Media Interest: Any interruption or outage that may cause public or news media attention

#### ***911:***

- A central office isolation from the E911 network for = > 2 minutes or longer.
- Loss of 25% or more of the trunking capabilities from an E911 tandem to the PSAPs it serves for = > 2 minutes or longer (e.g. translations, trunking frame failure, etc.)
- A PSAP isolation from the E911 network for = > 2 minutes or longer (e.g. translations, trunking problems, etc.)
- A transport cable failure that isolates a central office from the E911 network; (Local switch to the E911 tandem) transport cable failure that isolates a PSAP from the E911 tandem;- A transport cable failure that results in the loss of 25% or more of the trunks/circuits (aggregate from an E911 tandem to the PSAPs served by that Tandem; A transport equipment failure that isolates a

# Service Quality Measurements

## Appendix A: Reporting Dimensions

	<p>central office from the E911 network; A transport equipment failure that isolates a Public Safety Answering Point (PSAP) tandem.; or A transport equipment failure that results in the loss of 25% or more of the trunks/circuits (aggregate) from an E911 tandem to the PSAPs served by that tandem.</p> <ul style="list-style-type: none"><li>• Federal Government, equipment or facility affecting 5 or more military special communication, isolations of FAA location or air ground facilities.- State and local agencies interruptions seriously affecting service to police, fire departments, hospitals, press, military, PBS's</li></ul>
<b>Trouble Types</b>	<ul style="list-style-type: none"><li>• Inside (Central Office) Dispatch - Out of Service</li><li>• Outside Dispatch - Out of Service</li><li>• Inside Dispatch – Degraded Service</li><li>• Outside Dispatch – Degraded Service</li><li>• No Access or No Trouble Found</li><li>• NXXs not loaded properly by ILEC</li><li>• NXXs not loaded properly by party other than CLEC/ILEC</li><li>• All Other Troubles</li></ul> <p><i>“Out of Service” means that the customer has no dial tone.</i></p> <p><i>“Dispatch” means that ILEC repair personnel must be dispatched to a location outside an ILEC building (to customer premises or other off-site facilities) to resolve the trouble.</i></p>

# Service Quality Measurements

## Appendix B: Glossary

### Appendix B: Glossary

<i>Term:</i>	<i>Definition:</i>
Abandoned Call:	An abandoned call occurs when the caller hangs up after the call has been delivered, but before the receiving party has answered the call.
Automatic Location Identification:	A proprietary database developed for E911 systems that provides for a visual display of the caller's telephone number, address and the names of the emergency response agencies that are responsible for that address. The ALI also shows an interim number portability telephone number if applicable.
Attenuation Distortion:	Attenuation Distortion measures the variation in loss at different frequencies across the voice frequency spectrum (200Hz – 3400 Hz).
Call Completion Rate:	The call completion rate for CLEC customers is determined by calculating the total number of calls placed by CLEC customers that were completed to the calling destination. The number of completed calls is then divided by the total # of call attempts made by CLEC customers during the reporting period.
Call Delivery Rate:	The call delivery rate for CLEC customers is determined by calculating the total # of calls received by CLEC customers. This number of delivered calls is then divided by the total # of call attempts received by the ILEC for termination to CLEC customers.
Common Trunks	Trunks carrying the traffic from more than one carrier, such as the trunking between a tandem switch and end office switches.
Completion:	A completion is the transaction that the ILEC sends to the CLEC to inform the CLEC that a requested order has been completed.
Dial Tone Delay:	The dial tone delay is determined for each trial completed during the reporting period by computing the time that transpires from a customer's going off-hook and the receipt of dial tone from the servicing central office. It should be measured in seconds and tenths of seconds. Post dial delay for each trial is determined for each trial completed during the reporting period by computing the time that transpires from when the last digit is dialed until a valid response is received by the customer. It should be measured in seconds and tenths of seconds
Direct End Office Trunks	Trunking from the serving central office to the central office switch (Class 5) used to connect subscriber loops.
Directory Assistance Database:	The database containing subscriber records used to provide live or automated operator-assisted directory assistance, including 411, 555-1212, NPA-555-1212.
Directory Listings:	Subscriber information, including name, address and phone numbers, that is published in any media, including traditional white/yellow page directories, CD ROM and other electronic formats.

# Service Quality Measurements

## Appendix B: Glossary

<i>Term:</i>	<i>Definition:</i>
FOC:	A FOC is a Firm Order Confirmation notification, which is the transaction that the ILEC will send to the CLEC to confirm that an order can be completed.
GR303-Compliant Loop Access Concentration	An alternative to physical and virtual collocation that enables CLECs to serve a greater number of unbundled loops with less transport and collocation costs through leasing GR303-compliant remote digital terminals (RDTs) (as an unbundled network element priced on forward-looking costs)—from the ILECs. Loops are then ordered to the RDTs and carried over leased transport to the CLEC's collocation area. Bellcore General Requirements-303 describes a family of generic criteria for integrated access systems that includes open interfaces for mix-and-match of (1) local digital switches with RDTs as well as (2) remote digital terminals and element management systems.
Held Orders:	Held orders are orders that the ILEC has confirmed (an FOC was returned to the CLEC) and that are overdue.
Idle Channel Circuit Noise:	The idle channel circuit noise for each trial is determined for each trial completed during the reporting month by computing the difference between the noise that exists in the channel when no signals are present and the reference noise. The resulting accumulated idle channel circuit noise for all trials is divided by the total # of trials completed during the reporting period.
Interface:	The interface is the ILEC interface that allows the CLEC to access the ILEC system
Interim Local Number Portability:	An interim service arrangement, such as by use of remote call forwarding, whereby subscribers who change local service providers may retain existing telephone numbers without impairment of quality, reliability or convenience when changing local service providers and remaining in their current location or changing their location or changing their location within the geographic area service by the initial carrier.
Internal or Administrative Use:	The carrier's use for intra-company communications or for operation of its business.
Jeopardy:	A jeopardy is a transaction that the ILEC sends to the CLEC to inform the CLEC that a previous order cannot be processed as specified in the original FOC.
Line Information Database	A signal control point database (linked by common channel signaling to other points in the network) that provides for such functions as calling card validation for telephone number cards issued by ILECs and other entities and validation for collect and billed-to-third-party services.

# Service Quality Measurements

## Appendix B: Glossary

<i>Term:</i>	<i>Definition:</i>
Loop-circuit Balance:	Loops-circuit balance should be measured in decibels and tenths of decibels above the reference noise. "Attenuation Distortion" should measure the variation in loss at different frequencies across the voice frequency spectrum (200Hz – 3400 Hz). It should be measured from the NID to the switch, and from the switch to the NID. It is measured by subtracting the loss at 1004 Hz from the loss at the frequency of interest, and should be reflected in tenths of decibels.
Master Street Address Guide:	A database defining the geographic area of an E911 service. It includes an alphabetical list of the street names, high-low house number ranges, community names and emergency service numbers provided by the counties or their agents.
Network Incident:	A network incident is an unplanned network occurrence that results in blocked calls
NXX:	The three-digit code that indicates the central office switch serving the called party. The NXX is the fourth, fifth and sixth digits of a telephone number as established within the North American Numbering Plan.
Physical Collocation:	A form of carrier network interconnection where the ILEC designates space on the floor of its central office for the CLEC to build a cage for its transmission equipment. With physical collocation, the CLEC services and maintains its own equipment.
Permanent Number Portability or Number Portability:	A long-term service arrangement whereby users of telecommunications services retain, at the same location, existing telephone numbers without impairment of quality, reliability or convenience when switching from one telecommunications carrier to another.
Post Dial Delay:	Post dial delay is the time that transpires from when the last digit is dialed until a valid response is received by the customer
Public Safety Answering Point	A public safety communications center that receives 911 calls placed by the public in a specific geographic area.
Return of Valid Completion:	Receipt of notification that service has been installed or is being provided to the customer and such service has been installed or provided.
Selective Router	A database service that automatically routes an E911 call to the PSAP that has jurisdictional responsibility for the service address of the telephone that dialed 911, irrespective of the telephone company exchange or wire center boundaries.
Signal to Noise Ratio:	Signal to Noise ratio is the ratio of usable signal being transmitted to the noise or undesired signal.

# Service Quality Measurements

## Appendix B: Glossary

<i>Term:</i>	<i>Definition:</i>
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Subscriber Loop Loss:	Subscriber loop loss is determined by computing the difference between the strength of the signal as it enters the loop and the strength of the transmitted signal. Signal strength is measured in decibels rounded to the nearest tenth of a decibel. The total number of trials completed during the reporting period divides the resulting accumulated decimal strength.
Subsequent Reports:	Customer trouble reports where the customer calls to check on the status of a previous trouble report (initial or repeat) that has not been cleared (closed or resolved) at the time of the call.
Syntax Reject:	A syntax reject is the transaction that an ILEC will return to a CLEC when a the CLEC has submitted an order transaction that the ILEC's gateway cannot process due to violation of published rules for formatting or content.
System:	The system is the combination of ILEC gateways, communications links, hardware and software that, in combination, is used to perform or support business functions or executes supporting transactions.
Tandem	A switch between a serving wire center and the end office switches that enables multiple carriers to trunk to one point rather than provide direct end office terminations to all switches.
Trouble Appointment:	A trouble appointment is a commitment made by the ILEC (to CLEC or to customer) to resolve a trouble.
Troubles:	Troubles include all reported difficulties with performance of resold services or UNEs, whether the report is the initial or a repeated report, that the CLEC refers to the ILEC repair process/interface for resolution. Subsequent reports are categorized separately.
Virtual Collocation:	A form of carrier network interconnection where the CLEC provides its transmission equipment to the ILEC to install in the ILEC's network. The ILEC then services and maintains the equipment for the CLEC.

**Spangler, Tom**

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**From:** Spangler, Tom  
**Sent:** Friday, June 18, 1999 2:58 PM  
**To:** Larry G Reed (E-mail); Larry G Reed (E-mail 2); Bruce MacLeod (E-mail); Robert L Palmer (E-mail); Hammond, Larry; Hill, Debbie; Spangler, Tom  
**Subject:** 6gg501!.DOC / Chart of Defendants and Issues in Mock/Lebow



6gg501!.DOC

Attached at the icon is a chart of defendants and issues in Mock/Lebow. It lists the issues in our case where EG&G Idaho is involved. It might be helpful for the meeting in Denver.

B

**PLAN FOR IMPLEMENTING  
THIRD PARTY TESTING**

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## Executive Summary

In order to find and fix problems that inhibit entry into the local market, the State Commission should select an independent, technically-skilled third party tester or testers (TPT) and mandate that the TPT design and conduct a thorough and independent test of U S WEST's Operational Support Systems (OSS). A process for selecting the TPT is recommended. The TPT should develop a detailed a specific test plan that will enable the TPT to test all U S WEST procedures, processes and systems offered by U S WEST for use by a CLEC entering the local market. The plan should include an Exception Process to be invoked by the TPT when the test identifies a critical flaw in the system or process under review, and must require repeated regression testing until the critical flaw is resolved.

The TPT should test processes (a relationship and operational analysis) as well as systems (a transaction-driven system analysis). Each of the entry options that may be used by a CLEC should be tested, including but not limited to resold services, unbundled network elements (UNEs), the UNE platform, UNE combinations other than the platform, extended loops, interim and permanent number portability, and operator and directory assistance services. The test plan should cover the full range of possible order types through the entire sequence of functionalities available to CLECs, and should evaluate all modes of market entry to ensure that OSS for all modes of entry contemplated by the Telecommunications Act is available to CLECs. Pre-ordering, ordering, provisioning, maintenance and repair and billing systems should be tested. Test orders should be designed to test U S WEST's ability to process commercial volumes, including spikes as well as sustained volume. Additionally, the TPT should establish a basis for comparing U S WEST's internal performance with the performance it provides to CLECs, and should collect data and records as necessary to evaluate such performance.

The final test report should determine whether U S WEST is providing nondiscriminatory access to its OSS and, through its OSS, to its underlying network.

## STEP ONE: CHOOSING THE THIRD PARTIES

**GOAL:** Selection of completely independent, technically skilled third party testers under mandate to design and conduct a thorough and independent test.

### Process Overview:

1. After input from parties, Commission establishes guidelines/principles for test process, including the scope of the test, which will establish a framework for the test plan that will be developed by the Third Party Testers (TPTs). Opportunities for input by parties will vary from state to state, and may include written comments, workshops or hearings.
2. State Commission then selects TPTs as described below.
  - A. Sole Source Procurement:

State procurement law may be applicable, although the Commission would not be paying the TPT. If possible under state procurement law, a knowledgeable and experienced vendor should be selected to develop and conduct the evaluation (the "Test Manager") and an experienced and technically skilled vendor should be selected to build the OSS interface and execute test transactions through that interface (the "Test Transaction Generator"). Both the Test Manager and the Test Transaction Generator will be referred to as "the TPT". Sole source procurement may be justified based on the prior experience of these parties and the highly technical and specialized nature of the test.
  - B. Request for Proposal (RFP) Process:

If sole source procurement is not possible, the state Commission would issue one or more Requests for Proposals (RFPs) for the Test Manager and the Test Transaction Generator as follows:

    - (1) The Test Manager should be selected first or both may be selected together.
      - (a) The state Commission could use the NY RFP as a template (See Appendix 2)
      - (b) Parties submit comments regarding suggested modifications to template. If Commission elects not to use NY RFP as template, parties would submit draft RFP for review.
      - (c) Commission reviews comments and issues RFP.
      - (d) Applicants' responses to RFP will be provided to staff and parties, all of whom rank selections and submit ranking to Commission, along with comments.
      - (e) Commission reviews comments, eliminates from consideration those who do not meet selection criteria, and selects applicant most highly ranked by the parties that meets all criteria.
    - (2) If two sequential RFPs are desired, the Test Manager will assist the Commission in preparation of an RFP for selection of the Test Transaction Generator, following the same

template/comment/review procedure noted above. (See Appendix 3)

**Discussion:**

1. TPT must be demonstrably neutral and independent.
2. The state Commission, rather than U S WEST or CLECs, will be the TPT's client.
3. Sole source procurement would be faster and more cost-effective than the RFP process. If sole source procurement is not available, use of the NY RFP would offer a proven baseline and expedite the process.

## STEP TWO: DEVELOPING THE TEST PLAN

**Goal:** A detailed and specific test plan that will enable the TPT to test all U S WEST procedures, processes and systems offered by U S WEST for use by a CLEC entering the local market.

### Process overview:

1. TPT gathers information and prepares test plan.
  - A. TPT gathers information from CLECs regarding U S WEST 'products' that CLECs may purchase from U S WEST.
  - B. TPT gathers information from U S WEST regarding procedures, processes and systems available to CLECs.
  - C. TPT uses this information to develop plan that will include two types of tests:
    - (1) Relationship and operational analysis
    - (2) Transaction-driven system analysis
  - D. TPT publishes draft plan for comment by parties, including Commission staff.
  - E. TPT revises plan if necessary.
  - F. TPT issues final test plan.
2. To ensure integrity, the entire testing process should be open:
  - A. All information provided by U S WEST to the TPT must be available to CLECs and distributed at the same time.
  - B. All written communications between U S WEST and the TPT should be provided to the CLECs.
  - C. The TPT should keep minutes of all verbal contacts between the TPT and U S WEST, which promptly would be distributed to the CLECs.
  - D. The CLECs should have all information necessary to allow them to verify, through concurrent testing or commercial operations, the processes under investigation by the TPT to ensure that real-world experience bears out the tester's experience.
3. Test plan must include an Exception Process to be invoked by TPT when the test identifies a critical flaw in system or process under review, and must require repeated regression testing until the critical flaw is resolved.
  - A. TPT would issue a notice of exception, documenting the flaw.
  - B. U S WEST would be given an opportunity to respond to the exception, with response provided to CLECs.
  - C. Thereafter, CLECs and staff would have the opportunity to submit comments.
  - D. If U S WEST elects to clear the exception, it shall use a Change Control Process or Account Management Process to do so, and the TPT shall document and evaluate U S WEST's efforts to clear the exception.
  - E. Once U S WEST determines that the flaw has been remedied, the TPT shall re-test the system or process, and shall repeat this process as necessary until the critical flaw is resolved or U S WEST elects not to clear the exception.

- F. The Exception Process documentation should be available on a public Web site accessible by all interested parties.

**Discussion:**

The Test plan must be developed by TPT, based upon information gathered independently by TPT, and with opportunity for comment by parties and staff. The Plan should include protocols to test processes (relationship and operational analysis) as well as systems (transaction-driven system analysis).

**1. Relationship and Operational Analysis:**

- A. The Test plan should allow the TPT to evaluate the entire market entry process, using all modes of entry contemplated by the Telecommunications Act, regardless of whether any single CLEC currently is using such entry strategy in U S WEST's territory, and regardless of pending legal challenges to issues related to provision of UNEs or UNE combinations.
- B. TPT should incorporate test protocols to evaluate day-to-day operations and operational management practices, including policy development, development of procedures and procedural change management. The TPT should validate and verify processes to determine that they function correctly and according to documentation and expectations.
- C. The Test plan should allow the TPT to 'stand in the shoes' of a CLEC entering U S WEST's market, so it will be able fairly to evaluate U S WEST's performance with regard to all tasks normally performed in conjunction with a CLEC's market entry, including but not limited to:
  - (1) Account establishment and management
  - (2) Interface development
  - (3) Interconnection planning
  - (4) Network design
  - (5) Collocation planning
  - (6) System administration help
  - (7) CLEC training
  - (8) Forecasting
  - (9) Interconnection agreement or adoption of SGAT
- D. TPT must rely upon as well as evaluate U S WEST's established methods and procedures, including its Change Control Process and Account Management Process.
  - (1) All changes to systems, processes and documentation during the test must be made through established Change Control or Account Management Process, whether initiated by U S WEST or requested by the TPT or a CLEC.
  - (2) Test plan must include an evaluation of U S WEST's compliance with its established procedures.

**2. Transaction-driven system analysis:**

TPT should develop test protocols to initiate transactions, track transaction progress, and analyze transaction completion results to evaluate all systems being tested. In order to do so, the TPT must (a) define service order types to be processed, using U S WEST's pre-ordering, ordering and provisioning systems; (b) define maintenance, repair and emergency restoration scenarios; and (c) define CLEC billing requirements.

A. Defining service order types to be processed:

- (1) Each of the entry options that may be used by a CLEC should be tested, including but not limited to resold services, UNEs, UNE-P, UNE combinations other than the platform, extended loops, INP, LNP, and operator and directory assistance services.
- (2) The test plan should identify the full range of possible order types through the entire sequence of functionalities and over all system interfaces available to CLECs, regardless of whether any single CLEC is using all interfaces, including manual interfaces. Test should evaluate all modes of market entry including, but not limited to, resale, UNEs, UNE combinations and interconnection. This is needed to ensure that OSS for all modes of entry contemplated by the Telecommunications Act is available to CLECs regardless of whether other barriers currently prevent CLECs from entering the local market.
- (3) Order types would be used to generate detailed, real-world scenarios, including specific order and customer information, which will form the basis for specific test orders. Order types should not be limited to those currently in use.
- (4) The plan should provide for test orders to be initiated and followed through the entire sequence of functions, including preordering, ordering, provisioning, maintenance and repair, and billing. More detailed requirements for testing each function are listed below.
- (5) Test orders should be placed using the process described in U S WEST's documentation, and should allow for a thorough assessment of U S WEST's systems in expected real-world operation. Orders should be designed to test:
  - (a) Electronic flow-through
  - (b) Manual procedures
  - (c) Timeliness
  - (d) System fault tolerance
  - (e) Restoration and backup procedures
  - (f) U S WEST's ability to identify and respond appropriately to foreseeable transaction errors (invalid USOC, incorrectly populated field) and change orders
  - (g) Ability to process commercial volumes, including spikes as well as sustained volume
- (6) The mix of orders should be realistic, involving the types of orders that are likely in a competitive environment. CLECs should be able to provide input to the TPT. Relationships (ratios) between

transaction types should also be realistic, for example the ratio of pre-order transactions to order transactions and invalid orders to valid orders.

- (7) The TPT should develop, submit, and track the Local Service Requests (LSRs) and Access Service Requests (ASRs) when used to order local services and products based on U S WEST and CLEC provided documentation.
- (8) The process for ordering and obtaining CLEC collocation within U S WEST end offices must be tested.
- (9) See Appendix 1 for specific requirements for testing pre-ordering, ordering and provisioning.

B. Define maintenance, repair and emergency restoration scenarios:

- (1) Test orders should allow for evaluation of the electronic bonding interfaces and non-bonded interfaces, and should test functionalities including OSS interface availability, average OSS response interval, average answer time-repair centers, missed repair appointments, customer trouble report rate, mean time to repair, percent repeat troubles (within 30 days) and out of service greater than 24 hours.
- (2) Maintenance and repair functionalities for each possible market entry option should be tested, including resale, interconnection and UNEs, individually and in combinations, including the UNE platform. Again, the test plan should specify that pending legal challenges to the issue of whether, to what extent and at what price U S WEST may or may not be required to offer any particular UNE or combination of UNEs may not be considered in developing and processing test orders.
- (3) Order types must be sufficiently defined to allow testing and evaluation of all maintenance and repair functions, on a network as well as customer-specific basis, and on an emergency as well as routine basis, including:
  - (a) OSS and work processes such as
    - (i) Manual
    - (ii) IMA
    - (iii) EB-TA
    - (iv) TI/MI
    - (v) MLT
    - (vi) Legacy systems
    - (vii) Central office and field forces
  - (b) Performance measurements such as
    - (i) Interface availability
    - (ii) Response interval
    - (iii) Repair Center Answer time
    - (iv) Missed repair appointments
    - (v) Trouble report rate and mean time to restore
    - (vi) Repeat Trouble Report Rate

- (vii) Out of service greater than 24 hours
  - (viii) OS/DA answer speed
  - (ix) OS/DA percent answered within X seconds
  - (x) Trunk group service summary and detail
- (4) In addition to documenting maintenance and repair in connection with test orders, the test should include trouble created and reported by the tester, including:
  - (a) Open and short on the main distribution frame
  - (b) Open and short on CLEC's collocated frame
  - (c) Noise/echo on the line
- C. Define CLEC Billing Requirements:
  - (1) Test orders should allow for evaluation of invoice accuracy, invoice timeliness, usage data accuracy, and usage data, timeliness, and ability to capture usage data for all calls including local and access.
  - (2) The test should also include an audit of U S WEST's end-user billing, wholesale billing, reciprocal compensation billing, and access billing. The test should cover three complete billing cycles, which can be compressed in time within U S WEST's systems.
  - (3) Billing functionalities for each market entry option should be tested, including resale, interconnection and UNEs, individually and in combinations, including the UNE platform. Again, test plan should specify that pending legal challenges to the issue of whether, to what extent and at what price U S WEST may or may not be required to offer any particular combination of UNEs may not be considered in developing and processing test orders.
  - (4) Order types must be sufficiently defined to allow testing and evaluation of all billing functions, on a wholesale as well as customer-specific basis, including:
    - (a) OSS and work processes such as
      - (i) Daily Usage Files
      - (ii) CMDS
      - (iii) EMR
      - (iv) CRIS
      - (v) CABS
      - (vi) Industrial billing
      - (vii) Legacy systems
    - (b) Performance measurements such as
      - (i) Invoice accuracy and timeliness
      - (ii) Usage accuracy
      - (iii) Usage timeliness
  - (5) Test protocol should ensure that U S WEST provides reliable and verifiable billing data that can be used by TPT to render complete and accurate bills for all services, including usage detail to its wholesale and retail "customers".

- (6) Test should continue over the course of at least three complete billing cycles to ensure results are verifiable and reliable.

### **STEP THREE: PRE-TEST SETUP ACTIVITIES**

**GOAL:** Completion of three pre-test activities in preparation for testing activities: (1) Establish basis for comparison of U S WEST's internal and external performance, (2) assemble resources necessary to perform test, and (3) attain test plan entrance criteria.

#### **Process Overview:**

1. Establish basis for comparison of performance:
  - A. Establish activities and outcomes to be tracked.
    - (1) The starting point should be the measures, standards, and disaggregation levels required by the Local Competition User's Group Service Quality Measures Document, V. 7.0 (or the version most current at the time).
    - (2) The TPT reviews performance measures currently ordered by Commission or offered by U S WEST.
    - (3) Based on these sources and based on other information collected by the TPT during the test development process, the TPT establishes meaningful method to track and compare U S WEST's performance in its provision of service to itself and to CLECs during the test process.
  - B. After appropriate tracking and comparison measures have been established, the TPT audits U S WEST's implementation of such measures to determine completeness, accuracy and reliability of U S WEST's performance reporting process.
2. Assembling test resources:
  - A. TPT obtains Test Bed of working telephone numbers and associated Customer Service Records.
  - B. TPT obtains test lines from a variety of sources.
3. Attain test plan entrance criteria:
  - A. Test plan has been completed.
  - B. All required U S WEST interfaces are operationally ready.
  - C. The Test Transaction Generator Vendor must be operationally ready.
  - D. CLEC facilities and personnel are available to support the CLEC elements of the Test plan.

#### **Discussion:**

These are three separate activities that may proceed concurrently.

1. Establishing basis for comparison of performance and evaluating its implementation:
  - A. At a minimum, the following aspects of performance must be audited:
    - (1) Documentation review: All supporting documentation for the performance measurement definitions, calculations, inclusions, exclusions, disaggregation, and data retention must be identified and explained to the auditor.

- (2) Compliance review: All software procedures, including data collection, calculation and retention, must be assessed for conformance to the documented system.
    - (3) Output validation: System outputs must be assessed to determine whether reports are complete, accurate and timely and whether data transferred to data stores are accurate and up to date.
    - (4) Comparison validation: Comparative procedures must be assessed to assure that U S WEST uses the methodology designated for determining compliance with performance requirements.
  - B. TPT should collect data and manual records as necessary to evaluate performance, including but not limited to:
    - (1) Data recorded by TPT, reflecting the TPT's test experience, such as:
      - (a) Systems records from the electronic interface established with U S WEST
      - (b) Data gathered from CLEC systems where those systems are used as the interface vehicle
      - (c) Manual records kept by the TPT
    - (2) Data supplied by CLECs, reflecting commercial experience, including manual records.
    - (3) Data supplied by U S WEST in compliance with the performance measures established by the TPT.
    - (4) Manual records kept by test participants.
  - C. TPT shall analyze the collected data using appropriate statistical techniques to determine whether such performance is provided at parity. The TPT shall issue an Exception in each instance where it determines that performance is not provided at parity.
  - D. The tracking and comparison methodology established by the TPT must be detailed and disaggregated in order to allow for parties (the Commission staff, the TPT, and CLECs) to collect data that can be evaluated on "apples-to-apples" basis.
- 2. Assembling resources necessary to perform the test:
  - A. TPT should obtain a Test Bed of working telephone numbers and associated Customer Service Records.
    - (1) Obtain a sufficient quantity of numbers to use for purposes of testing. The quantity of telephone numbers shall be determined by the TPT and must be sufficient to allow concurrent, rather than sequential processing of test orders so as to expedite the testing process.
    - (2) Test bed should consist of numbers from a representative cross-section of U S WEST's switches throughout the state. Actual loops will not be connected; the numbers will be used to test the provisioning systems in U S WEST's switch for resold service and the unbundled local switching element.

- B. TPT will need to obtain a number of test lines in addition to the Test Bed of telephone numbers to test provisioning, repair, restoration, call performance and billing.
  - (1) Residence test lines should be provisioned to CLEC and U S WEST employees as customers in order to allow testing on actual working lines. These lines should be non-critical second lines established for test purposes.
  - (2) New lines should be provisioned to a location(s) that the TPT may access for verification of ordering, provisioning and repair.
- 3. Attainment of entrance criteria:
  - A. Test plan has been completed by the TPT.
  - B. All pending legal and regulatory proceedings that affect the ability to perform the test must be concluded in a manner that allows testing to proceed.
  - C. All required U S WEST interfaces are operationally ready. Electronic interfaces to all OSS access functions must be fully tested and operational.
  - D. The Test Transaction Generator Vendor must be operationally ready.
  - E. CLEC facilities and personnel are available to support the CLEC elements of the Test plan. This could include designation of appropriate on-site working space and equipment for the testers, the training or hiring of necessary personnel, and any other appropriate measures in order to facilitate test implementation.

## **STEP FOUR: PERFORM RELATIONSHIP AND OPERATIONAL ANALYSIS TESTING**

**GOAL:** A thorough analysis of the systems, processes and other operational elements associated with U S WEST's establishment and maintenance of business relationships with CLECs to evaluate adequacy, completeness and effectiveness.

### **Process Overview:**

Per test plan.

### **Discussion:**

1. The TPT must build interfaces necessary to process CLEC-to-U S WEST transactions.
  - A. In order to determine whether U S WEST's documentation is sufficient to permit CLECs to develop their OSS, TPT should build all OSS interfaces necessary to enter the market across the range of order types.
  - B. Interfaces built by the TPT should be sufficient to allow the TPT to simulate, as closely as possible, the experience of a CLEC entering the local market.
  - C. Test systems can be built more quickly and cheaply than CLEC systems because they are not integrated into real back-end business operations and need not be as large and robust as actual commercial systems.
2. Activities must be based upon documentation routinely provided to all CLECs, including technical specifications, business rules, CLEC handbooks, and support routinely provided to all CLECs.
3. As part of the process, TPT should test and review all supporting documentation and should determine and report upon:
  - A. Ease of understanding and interpretation
  - B. Accuracy and reliability
  - C. Consistency
  - D. If problems exist, whether fully documented updates were timely provided to all CLECs
  - E. Adequacy of control process for documentation changes
4. Upon completion of interfaces, TPT conducts systems qualification (connectivity and end-to-end testing).
  - A. If no documented qualification process is in place, TPT prepares documentation of test process that can be applied in the future.
  - B. If qualification process fails, TPT issues Exception.
5. During on-going operation of the test, TPT conducts evaluations of the change management and system administration help desks and escalation procedures.
6. The TPT also must evaluate the business-to-business aspects of attempting to enter the local market, including:
  - A. Account establishment and management
  - B. Network design, collocation, and interconnection planning
  - C. CLEC training

- D. Forecasting
- 7. As part of the business-to-business evaluation, TPT should test and review all supporting documentation and should determine and report upon:
  - A. Ease of understanding and interpretation
  - B. Accuracy and reliability
  - C. Consistency
  - D. If problems exist, whether fully documented updates were timely provided to all CLECs
  - E. Adequacy of control process for documentation changes

## STEP FIVE: CONDUCTING THE TRANSACTIONAL TEST

**GOAL:** Find and fix problems that would inhibit entry into the local market. U S WEST must clear all identified exceptions before it will be considered to have passed the test.

### Process Overview:

Per test plan.

### Discussion:

1. Transactional testing must be end-to-end, and thoroughly test pre-ordering, ordering, provisioning, maintenance and repair, and billing, including integration of pre-ordering and ordering. Access to all of these functions is imperative for full-scale commercial operation by competitors.
2. Test orders should be as “blind” as possible. Additionally, volume and stress testing should be initiated without advance warning to U S WEST.
3. Test should include “normal” and peak commercial volumes, to be calculated based on information from U S WEST and the CLECs. Data to be evaluated would include:
  - A. U S WEST Demand Forecast for 1999 and 2000
  - B. U S WEST In-Service Actuals and Forecasts
  - C. CLEC Service Forecast Data Compiled by U S WEST
  - D. Historic CLEC OSS Usage Data
  - E. U S WEST CLEC Transaction Actuals as of (most recent available)
  - F. Resale Service Activity Reports
  - G. Case Studies of Market Share Changes in related Markets
  - H. CLEC Forecasts provided to TPT
4. “Normal” commercial volume would be that expected in the normal course of business after full competition is in place.
  - A. Peak volumes should be established of at least 150 percent of “normal” commercial volumes.
  - B. A volume stress test should be conducted over multiple days, in the TPT would place a large number of orders per hour over a course of several days in order to determine whether U S WEST can process such orders and whether performance is provided at parity.
  - C. The test should include meaningful volumes of manual orders.

## **STEP SIX: FINAL ANALYSIS AND REPORT**

**GOAL:** The final test report should determine whether U S WEST is providing nondiscriminatory access to its OSS and, through its OSS, to its underlying network. The report should describe the underlying approach of the tests, describe the methodology used in each of the tests, and list the test data and results of each test. The report should provide sufficient detail to allow uninvolved third parties to fully understand how the test results were derived.

### **Process Overview:**

1. The TPT completes qualitative and quantitative analysis and issues a draft report at the contracted interval.
2. Parties, including the Commission staff, will have the opportunity to provide comments.
3. TPT publishes final report.

### **Discussion:**

1. Final report should provide results of the test, per the test plan by the TPT.
2. The report should describe any differences between the access to OSS functions U S WEST provides itself and that which it provides to CLECs. Operational effect of such differences should be analyzed and TPT should make recommendations to rectify such differences.
3. Generally accepted statistical methods should be used to conduct analysis and render conclusions about competitive conditions.
  - A. Each test should define the data population observed, measurements taken, and statistical tests used.
  - B. Data should be normalized, tabulated and archived in a way that allows verification of test results and re-analysis of data using additional statistical methods, if appropriate.
  - C. Hypothesis testing should frame the analysis of test results, whereby statistics would be calculated and analyzed to determine whether or not to reject a null hypothesis.
4. Final report specifically should certify:
  - A. Relative ease or complexity of creating each interface with the supplied documentation.
  - B. Any additional support required of and provided by U S WEST to create the interface.
  - C. Timeliness and level of support provided by after-market support services such as help desks and hot lines.
  - D. Any areas of improvement that would materially reduce the cost, complexity, and time of this development and operation to the CLECs or U S WEST.

5. The report should recommend appropriate follow-up and oversight measures to ensure continued adherence to standards already achieved and prevent degradation of performance over time.



## **APPENDIX ONE**

### **SPECIFIC REQUIREMENTS FOR TESTING PRE-ORDERING, ORDERING AND PROVISIONING**

1. Pre-ordering:
  - A. Pre-ordering functionalities for each possible market entry option should be tested, including resale, interconnection and UNEs, individually and in combinations, including the UNE platform.
  - B. The test plan should specify that pending legal challenges to the issue of whether, to what extent and at what price U S WEST may or may not be required to offer any particular UNE or combination of UNEs may not be considered in developing or processing test orders.
  - C. Test orders should be sufficiently defined to allow for testing of:
    - (1) All pre-ordering functions such as address validation, CSR availability, USOC availability, numbering resource availability, due date interval and availability, editing capabilities, systems integration capabilities, telephone number verification, current PIC Status verification, and facilities availability including loop qualification for various types of digital loops.
    - (2) All pre-ordering OSS and work processes, including editing capabilities and systems integration capabilities of:
      - (a) IMA
      - (b) EDI
      - (c) EXACT
      - (d) EB-TA
      - (e) Interconnect Service Center and other associated centers
      - (f) Account team
      - (g) Legacy systems
    - (3) Performance measurement, such as:
      - (a) Response intervals
      - (b) Interface availability
      - (c) Facilities availability
      - (d) Information accuracy
2. Ordering:
  - A. Test orders should allow for testing access to product and service offerings for both simple and complex orders and promotions, performance of the provisioning and order status reports, editing capabilities and the integration of ordering systems with other systems.
  - B. Ordering functionalities for each possible market entry option should be tested, including resale, interconnection and UNEs, individually and in combinations, including the UNE platform. Again, test plan should specify that pending legal challenges to the issue of whether, to what extent and at

what price U S WEST may or may not be required to offer any particular UNE or combination of UNEs may not be considered in developing or processing test orders.

C. Order types must be sufficiently defined to allow testing and evaluation of all ordering functions, including:

- (1) Business processes such as:
  - (a) Editing/format/reject
  - (b) Intervention
  - (c) Loop qualification
  - (d) Facility availability
  - (e) Confirmation
  - (f) OSS and work processes such as:
    - (i) Manual
    - (ii) EDI
    - (iii) EXACT
    - (iv) IMA
    - (v) EB-TA
    - (vi) Interconnect Service Center and other associated centers
    - (vii) Account team
    - (vii) Legacy systems
- (2) Performance measurements such as:
  - (a) Percent flow-through
  - (b) Percent rejects
  - (c) Reject interval
  - (d) FOC interval
  - (e) Speed of answer and call abandonment
  - (f) Collocation response time
  - (g) Average offered interval
  - (h) Average submissions per order

3. Provisioning:

- A. Test orders should require a sizeable quantity of orders to be run through the system from start to finish and actually provisioned.
- B. Provisioning and installation functionalities for each possible market entry option should be tested, including resale, interconnection and UNEs, individually and in combinations, including the UNE platform. Again, test plan should specify that pending legal challenges to the issue of whether, to what extent and at what price U S WEST may or may not be required to offer any particular UNE or combination of UNEs may not be considered in developing and processing test orders.
- C. Order types must be sufficiently defined to allow testing and evaluation of all provisioning and installation functions, including:
  - (1) Business processes such as:
    - (a) Loop qualification
    - (b) Facility availability
    - (c) Jeopardy notice

- (d) Completion notice
- (2) OSS and work processes such as:
  - (a) FOCs
  - (b) Manual
  - (c) EDI
  - (d) EXACT
  - (e) IMA
  - (f) EB-TA
  - (g) Interconnect Service Center and other associated centers
  - (h) Legacy systems
  - (i) CO and field forces
- (3) Performance measurements such as:
  - (a) Completion interval
  - (b) Held order
  - (c) Jeopardy
  - (d) Percent missed appointments
  - (e) Percent trouble within 30 days
  - (f) Order accuracy
  - (g) Coordinated conversions
  - (h) Completion notice interval
  - (i) 911 timeliness and accuracy
  - (j) Collocation arrangement time
  - (k) Percent collocation due date missed
  - (l) Percent completions/attempts without notice or with less than 24 hours notice
  - (m) Percent service loss from early cuts
  - (m) Percent loss from late cuts
  - (n) Average database update interval other than 911
  - (o) Database accuracy other than 911

**APPENDIX TWO**

**NEW YORK RFP FOR TEST MANAGER**

**APPENDIX THREE**

**NEW YORK RFP FOR TEST TRANSACTION GENERATOR**

# Local Competition Users Group

## Statistical Tests for Local Service Parity

February 6, 1998

Membership: AT&T, Sprint, MCI, LCI, WorldCom

Version 1.0

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## **Executive Summary**

The Local Competition Users Group has drafted 27 Service Quality Measurements (SQMs) that will be used to measure parity of service provided by incumbent local exchange carriers (ILECs) to competitive local exchange carriers (CLECs). This set of measures includes means, proportions, and rates of various indicators of service quality. This document proposes statistical tests that are appropriate for determining if parity is being provided with respect to these measurements.

Each month, a specified report of the 27 SQMs will be provided by the ILEC, broken down by the requested reporting dimensions. The SQMs are to be systematically developed and provided by the ILECs as specified. Test parameters will be calculated so that the overall probability of declaring the ILEC to be out of parity purely by chance is very small. For each SQM and reporting dimension reported, the difference between the ILEC and CLEC results is converted to a z-value. Non-parity is determined if a z-value exceeds a selected critical value.

## Introduction

### *Purpose*

The Local Competition Users Group (LCUG) is a cooperative effort of AT&T, MCI, Sprint, LCI and WorldCom for establishing standards for the entry of new companies (competitive local exchange carriers, or CLECs) into the local telecommunications market. A key initiative of the LCUG is to establish measures of parity for services provided by incumbent local exchange carriers (ILECs). In short, parity means that the support ILECs provide on behalf of the CLECs is no lesser in quality than the service provided by the ILECs to their own customers.

The LCUG has drafted a document listing service quality measurements (SQMs) that must be reported by the ILECs to insure that CLECs are given parity of support. The SQM document has been submitted to the FCC and made available to PUCs in all 50 states and is pending approval by many of these regulatory agencies. This document has been drafted to describe statistical methodology for determining if parity exists based on the measurements defined in the SQM document.

### *Service Quality Measurements*

The LCUG has identified 27 service quality measurements for testing parity of service. These are:

Category	ID	Description
Pre-Ordering	PO-1	Average Response Interval for Pre-Ordering Information
Ordering and Provisioning	OP-1	Average Completion Interval
	OP-2	Percent Orders Completed on Time
	OP-3	Percent Order Accuracy
	OP-4	Mean Reject Interval
	OP-5	Mean FOC Interval
	OP-6	Mean Jeopardy Interval
	OP-7	Mean Completion Interval
	OP-8	Percent Jeopardies Returned
	OP-9	Mean Held Order Interval
	OP-10	Percent Orders Held >= 90 Days
	OP-11	Percent Orders Held >= 15 Days
Maintenance and Repair	MR-1	Mean Time to Restore
	MR-2	Repeat Trouble Rate
	MR-3	Trouble Rate
	MR-4	Percentage of Customer Troubles Resolved Within Estimate
General	GE-1	Percent System Availability
	GE-2	Mean Time to Answer Calls
	GE-3	Call Abandonment Rate
Billing	BI-1	Mean Time to Provide Recorded Usage Records
	BI-2	Mean Time to Deliver Invoices
	BI-3	Percent Invoice Accuracy
	BI-4	Percent Usage Accuracy

Operator Services and Directory Assistance	OSDA-1	Mean Time to Answer
Network Performance	NP-1	Network Performance Parity
Interconnect / Unbundled Elements and Combos	IUE-1	Function Availability
	IUE-2	Timeliness of Element Performance

The Service Quality Measurements document describes the importance of each measure as an indicator of service parity. The SQM document also describes reporting dimensions that will be used to break each measure out by like factors (*e.g.*, major service group).

## ***Why We Need to Use Statistical Tests***

The Telecommunications Act of 1996 requires that ILECs provide nondiscriminatory support regardless of whether the CLEC elects to employ interconnection, services resale, or unbundled network elements as the market entry method. It is essential that CLECs and regulators be able to determine whether ILECs are meeting these parity and nondiscriminatory obligations. In order to make such a determination, the ILEC's performance for itself must be compared to the ILEC's performance in support of CLEC operations; and the results of this comparison must demonstrate that the CLEC receives no less than equal treatment compared to that the ILEC provides to its own operations. Where a direct comparison to analogous ILEC performance is not possible, the comparative standard is the level of performance that offers an efficient CLEC a meaningful opportunity to compete.

When making the comparison of ILEC results to CLEC results, it is necessary to employ comparative procedures that are based upon generally accepted statistical procedures. It is important to use statistical procedures because all of the ILEC-CLEC processes that will be measured are processes that contain some degree of randomness. Statistical procedures recognize that there is measurement variability, and assist in translating results data into useful decision-making information. A statistical approach allows for measurement variability while controlling the risk of drawing an inappropriate conclusion (*i.e.*, a "type 1" or "type 2" error, discussed in the next section).

## **Basic Concepts and Terms**

### ***Populations and Samples***

Statistical procedures will permit a determination whether the support that the ILECs provide to CLECs is indistinguishable from the support provided by the ILECs to their own customers. In statistical terms, we will determine whether two "samples", the ILEC sample and the CLEC sample, come from the same "population" of measurements.

The procedures described in this paper are based on the following assumption: *When parity is provided, the ILEC data and CLEC data can both be regarded as samples from a common*

*population of possible outcomes.* In other words, if parity exists, the measured results for a CLEC should not be distinguishable from the measured results for the ILEC, once random variability is taken into account. Figure 1 illustrates this concept. On the right side of the figure are histograms of two samples. In this illustration, the ILEC sample contains 200 observations (data values) and the CLEC sample contains 50. Note that the two histograms are not exactly alike. This is due to sampling variation. The assumption that parity exists implies that both samples were drawn from the same population of values. If it were possible to observe this population completely, the population histogram might appear as shown on the left of the Figure. If the samples were indeed taken from this population, histograms drawn for larger and larger samples would look more and more like the population histogram. Figure 1 shows that even when parity is being provided, there will be differences between the samples due to sampling variability. Statistical tests quantify the differences between the two samples and make proper allowance for sampling variability. They assess the chance that the differences that are observed are due simply to sampling variability, if parity is being provided.

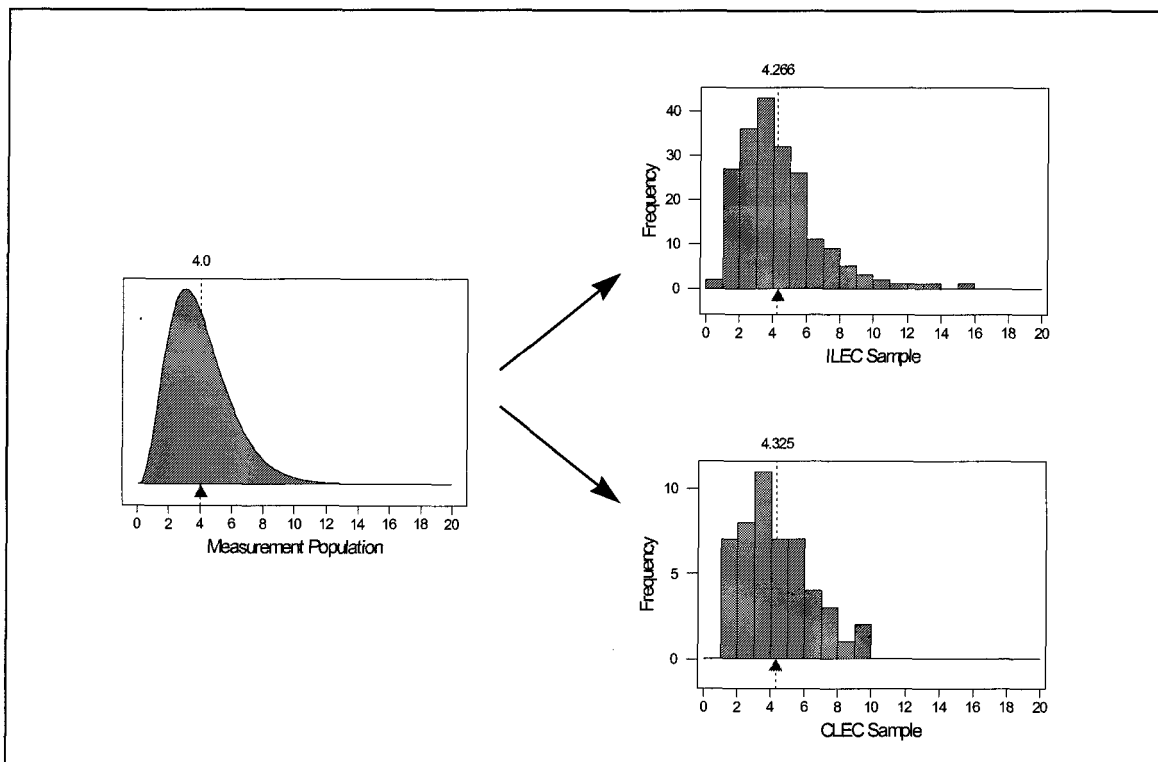


Figure 1.

## ***Measures of Central Tendency and Spread***

Often, distributions are summarized using "statistics." For the purpose of this paper, a "statistic" is simply a calculation performed on a sample set of data. Two common types of statistics are known as measures of "central tendency" and "spread."

A measure of central tendency is a summary calculation that describes the middle of the distribution in some way. The most common measure of central tendency is called the "mean" or "average" of the distribution. The mean of a sample is simply the sum of the data values divided by the sample size (number of observations). Algebraically, this calculation is expressed as

$$\bar{x} = \frac{\sum x}{n},$$

where  $x$  denotes a value in the sample and  $n$  denotes the sample size. The mean describes the center of the distribution in the following way: *If the histogram for a sample were a set of weights stacked on top of a flat board placed on top of a fulcrum (a "see-saw"), the mean would be the position along the board at which the board would balance.* (See Figure 1.) The mean in Figure 1 is indicated by the small triangle at approximately the value "4" on the horizontal axis.

A measure of spread is a summary calculation that describes the amount of variation in a sample. A common measure of spread is called the "standard deviation" of the sample. The standard deviation is the typical size of a deviation of the observations in the sample from their mean value. The standard deviation is calculated by subtracting the mean value from each observation in the sample, squaring the resulting differences (so that negative and positive differences don't offset), summing the squared differences, dividing the sum by one less than the sample size, then taking the square root of the result. Algebraically, this calculation is expressed as

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}.$$

While the notion of mean and standard deviation exists for populations as well as samples, the mathematical definition for the mean and standard deviation for populations is beyond the scope of this paper. However, their interpretation is generally the same as for samples. In fact, for very large samples, the sample mean and sample standard deviation will be very close to the mean and standard deviation of the population from which the sample was taken.

## ***Sampling Distribution of the Sample Mean***

In Figure 1 we showed the positions of the means of the population and the two samples with triangular symbols beneath the distributions. If we sample over successive months, we will get new ILEC samples and new CLEC samples each and every month. These samples will not be exactly like the one for the first month; each will be influenced by sampling variability in a

different way. In Figure 2, we show how sets of 100 successive ILEC means and 100 successive CLEC means might appear. The ILEC means can be thought of as being drawn from a population of sample means; this population is called the "sampling distribution" of these ILEC means. This sampling distribution is completely determined by the basic population of measurements that we start with, and the number of observations in each sample. The sampling distribution has the same mean as the population.

Figure 2 illustrates two important statistical concepts:

1. The histogram of successive sample means resembles a bell-shaped curve known as the Normal Distribution. This is true even though the individual observations came from a skewed distribution.
2. The standard deviation of the distribution of sample means is much smaller than the standard deviation of the observations themselves. In fact, statistical theory establishes the fact that the standard deviation on the population of means is smaller by a factor  $\sqrt{n}$ , where  $n$  is the sample size. This effect can be seen in our example: the distribution of the CLEC means is twice as broad as the distribution of the ILEC means, since the ILEC sample size (200) is four times as large as the CLEC sample size (50).

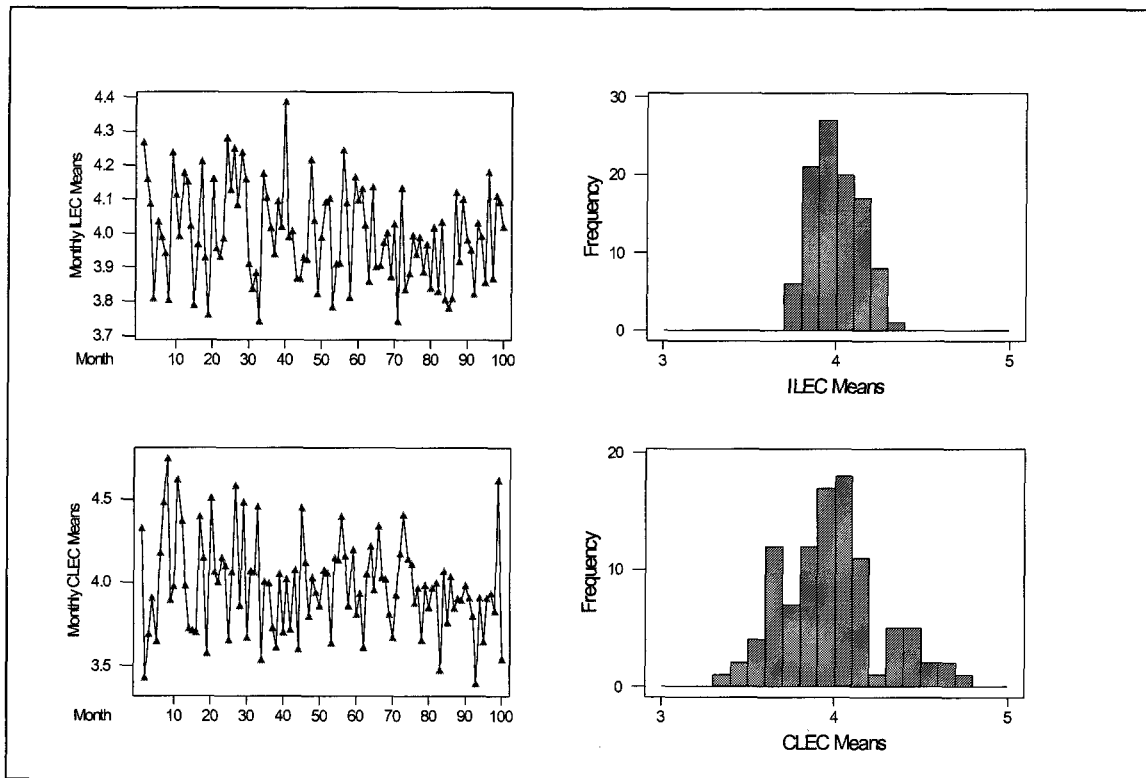


Figure 2.

It is common to call the standard deviation of the sampling distribution of a statistic the "standard error" for the statistic. We shall adopt this convention to avoid confusion between the standard deviation of the individual observations and the standard deviation (standard error) of the statistic. The latter is generally much smaller than the former. In the case of sample means, the standard

error of the mean is smaller than the standard deviation of the individual observations by a factor of  $\sqrt{n}$ .

### **The Z-test**

Our objective is to compare the mean of a sample of ILEC measurements with the mean of a sample of CLEC measurements. Suppose both samples were drawn from the same population; then the difference between these two sample means (*i.e.*,  $DIFF = \bar{x}_{CLEC} - \bar{x}_{ILEC}$ ) will have a sampling distribution which will

- (i) have a mean of zero; and
- (ii) have a standard error that depends on the population standard deviation and the sizes of the two samples.

Statisticians utilize an index for comparing measurement results for different samples. The index employed is a ratio of the difference in the two sample means (being compared) and the standard deviation estimated for the overall population. This ratio is known as a z-score. The z-score compares the two samples on a standard scale, making proper allowance for the sample sizes.

The computation of the difference in the two sample means is straightforward.

$$DIFF = \bar{x}_{CLEC} - \bar{x}_{ILEC}$$

The standard deviation is less intuitive. Nevertheless, statistical theory establishes the fact that

$$\sigma_{DIFF}^2 = \frac{\sigma^2}{n_{CLEC}} + \frac{\sigma^2}{n_{ILEC}},$$

where  $\sigma$  is the standard deviation of the population from which both samples are drawn. That is, the squared standard error of the difference is the sum of the squared standard errors of the two means being compared.<sup>1</sup>

We do not know the true value of the population  $\sigma$ , because the population cannot be fully observed. However, we can estimate  $\sigma$  given the standard deviation of the ILEC sample ( $\sigma_{ILEC}$ ).<sup>2</sup> Hence, we may estimate the standard error of the difference with

$$\sigma_{DIFF} = \sqrt{\frac{\sigma_{ILEC}^2}{n_{CLEC}} + \frac{\sigma_{ILEC}^2}{n_{ILEC}}} = \sqrt{\sigma_{ILEC}^2 \left[ \frac{1}{n_{CLEC}} + \frac{1}{n_{ILEC}} \right]}$$

<sup>1</sup> Winkler and Hays, *Probability, Inference, and Decision*. (Holt, Rinehart and Winston: New York), p. 370.

<sup>2</sup> Winkler and Hays, *Probability, Inference, and Decision*. (Holt, Rinehart and Winston: New York), p. 338.

If we then divide the difference between the two sample means by this estimate of the standard deviation of this difference, we get what is called a "z-score".

$$z = \frac{DIFF}{\sigma_{DIFF}}$$

Because we assumed that both samples were in fact drawn from the same population, this z-score has a sampling distribution that is very nearly Standard Normal, *i.e.*, having a mean of zero and a standard error of one. Thus, the z-score will lie between  $\pm 1$  in about 68% of cases, will lie between  $\pm 2$  in about 95% of cases, and will lie between  $\pm 3$  in about 99.7% of cases, always assuming that both samples come from the same population. Therefore, one possible procedure for checking whether both samples come from the same population is to compare the z-score with some cut-off value, perhaps +3. For comparisons where the values of z exceed the cutoff value, you reject the assumption of parity as not proven by the measured results. This is an example of a statistical test procedure. It is a formal rule of procedure, where we start with raw data (here two samples, ILEC measurements and CLEC measurements), and arrive at a decision, either "conformity" or "violation".

### ***Type 1 Errors and Type 2 Errors***

Each statistical test has two important properties. The first is the probability that the test will determine that a problem exists when in fact there is none. Such a mistaken conclusion is called a type one error. In the case of testing for parity, a type one error is the mistake of charging the ILEC with a parity violation when they may not be acting in a discriminatory manner. The second property is the probability that the test procedure will not identify a parity violation when one does exist. The mistake of not identifying parity violation when the ILEC is providing discriminatory service is called a type two error. A balanced test is, therefore, required.

From the ILEC perspective, the statistical test procedure will be unacceptable if it has a high probability of type one errors. From the CLEC perspective, the test procedure will be unacceptable if it has a high probability of type two errors.

Very many test procedures are available, all having the same probability of type one error. However the probability of a type two error depends on the particular kind of violation that occurs. For small departures from parity, the probability of detecting the violation will be small. However, different test procedures will have different type two error probabilities. Some test procedures will have small type two error when the CLEC mean is larger than the ILEC mean, even if the CLEC standard deviation is the same as the ILEC standard deviation, while other procedures will be sensitive to differences in standard deviation, even if the means are equal. Our proposals below are designed to have small type two error when the CLEC mean exceeds the ILEC mean, whether or not the two variances are equal.

## Tests of Proportions and Rates

When our measurements are proportions (e.g. percent orders completed on time) rather than measurements on a scale, there are some simplifications. We can think of the "population" as being analogous to an urn filled with balls, each labeled either 0(failure) or 1(success). In this population, the fraction of 1's is some "population proportion". Making an observation corresponds to drawing a single ball from this urn. Each month, the ILEC makes some number of observations, and reports the ratio of failures or successes to the total number of observations; the ILEC does the same for the CLEC. The situation is very similar to that discussed above; however, rather than a wide range of possible result values, we simply have 0's (failures) and 1's (successes). The "sample mean" becomes the "observed proportion", and this will have a sampling distribution just as before. The novelty of the situation is that now the population standard deviation is a known function of the population proportion<sup>3</sup>; if the population proportion is  $p$ , the population standard deviation is  $\sqrt{p(1 - p)}$ , with similar simplifications in all the other formulas.

There is a similar simplification when the observations are of rates, e.g., number of troubles per 100 lines. The formulas appear below.

## Proposed Test Procedures

### Applying the Appropriate Test

Three z-tests will be described in this section: the "Test for Parity in Means", the "Test for Parity in Rates", and the "Test for Parity in Proportions". For each LCUG Service Quality Measurement (SQM), one or more of these parity tests will apply. The following chart is a guide that matches each SQM with the appropriate test.

<i>Measurement (Corresponding LCUG Number)</i>	<i>Test</i>
Preordering Response Interval (PO-1)	Mean
Avg. Order Completion Interval (OP-1)	Mean
% Orders Completed On Time (OP-2)	Proportion
% Order (Provisioning) Accuracy (OP-3)	Proportion
Order Reject Interval (OP-4)	Mean
Firm Order Confirmation Interval (OP-5)	Mean
Mean Jeopardy Interval (OP-6)	Mean
Completion Notice Interval (OP-7)	Mean
Percent Jeopardies Returned (OP-8)	Proportion
Held Order Interval (OP-9)	Mean
% Orders Held $\geq$ 90 Days (OP-10)	Proportion
% Orders Held $\geq$ 15 Days (OP-11)	Proportion
Time To Restore (MR-1)	Mean

<sup>3</sup> Winkler and Hays, *Probability, Inference, and Decision*. (Holt, Rinehart and Winston: New York), p. 212.

Repeat Trouble Rate (MR-2)	Proportion
Frequency of Troubles (MR-3)	Rate
Estimated Time To Restore (MR-4)	Proportion
System Availability (GE-1)	Proportion
Center Speed of Answer (GE-2)	Mean
Call Abandonment Rate (GE-3)	Proportion
Mean Time to Deliver Usage Records (BI-1)	Mean
Mean Time to Deliver Invoices (BI-2)	Mean
Percent Invoice Accuracy (BI-3)	Proportion
Percent Usage Accuracy (BI-4)	Proportion
OS/DA Speed of Answer (OS/DA-1)	Mean
Network Performance (NP-1)	Mean, Proportion
Availability of Network Elements (IUE-1)	Mean, Proportion
Performance of Network Elements (IUE-2)	Mean, Proportion

### ***Test for Parity in Means***

Several of the measurements in the LCUG SQM document are averages (*i.e.*, means) of certain process results. The statistical procedure for testing for parity in ILEC and CLEC means is described below:

1. Calculate for each sample the number of measurements ( $n_{ILEC}$  and  $n_{CLEC}$ ), the sample means ( $\bar{x}_{ILEC}$  and  $\bar{x}_{CLEC}$ ), and the sample standard deviations ( $\sigma_{ILEC}$  and  $\sigma_{CLEC}$ ).
2. Calculate the difference between the two sample means; if *larger* CLEC mean indicates possible violation of parity, use  $DIFF = \bar{x}_{CLEC} - \bar{x}_{ILEC}$ , otherwise reverse the order of the CLEC mean and the ILEC mean.
3. To determine a suitable scale on which to measure this difference, we use an estimate of the population variance based on the ILEC sample, adjusted for the sized of the two samples: this gives the standard error of the difference between the means as

$$\sigma_{DIFF} = \sqrt{\sigma_{ILEC}^2 \left[ \frac{1}{n_{CLEC}} + \frac{1}{n_{ILEC}} \right]}$$

4. Compute the test statistic

$$z = \frac{DIFF}{\sigma_{DIFF}}$$

5. Determine a critical value  $c$  so that the type one error is suitably small.
6. Declare the means to be in violation of parity if  $z > c$ .

### **Example**

c: 3.58		Critical value for the test					
ILEC			CLEC			Test	
n	mean	variance	n	mean	variance	z	Violation
250	4.038	1.9547	50	5.154	23.2035	5.15	YES!

### Test for Parity in Proportions

Several of the measurements in the LCUG SQM document are proportions derived from certain counts. The statistical procedure for testing for parity in ILEC and CLEC proportions is described below. It is the same as that for means, except that we do not need to estimate the ILEC variance separately.

1. Calculate for each sample sample sizes ( $n_{ILEC}$  and  $n_{CLEC}$ ), and the sample proportions ( $p_{ILEC}$  and  $p_{CLEC}$ ).
2. Calculate the difference between the two sample means; if *larger* CLEC proportion indicates worse performance, use  $DIFF = p_{CLEC} - p_{ILEC}$ , otherwise reverse the order of the ILEC and CLEC proportions.
3. Calculate an estimate of the *standard error for the difference* in the two proportions according to the formula

$$\sigma_{DIFF} = \sqrt{p_{ILEC}(1 - p_{ILEC}) \left[ \frac{1}{n_{CLEC}} + \frac{1}{n_{ILEC}} \right]}$$

4. Hence compute the test statistic

$$z = \frac{DIFF}{\sigma_{DIFF}}$$

5. Determine a critical value  $c$  so that the type one error is suitably small.
6. Declare the means to be in violation of parity if  $z > c$ .

### Example

c: 3.58		Critical value for the test					
ILEC			CLEC			Test	
num	den	p	num	den	p	z	Violation
5	250	2.00%	7	40	17.50%	6.50	YES!

## Test for Parity in Rates

A rate is a ratio of two counts,  $num/denom$ . An example of this is the trouble rate experience for POTS. The procedure for analyzing measurements results that are rates is very similar to that for proportions.

1. Calculate the numerator and the denominator counts for both ILEC and CLEC, and hence the two rates  $r_{ILEC} = num_{ILEC}/denom_{ILEC}$  and  $r_{CLEC} = num_{CLEC}/denom_{CLEC}$ .
2. Calculate the difference between the two sample rates; if *larger* CLEC rate indicates worse performance, use  $DIFF = r_{CLEC} - r_{ILEC}$ , otherwise take the negative of this.
3. Calculate an estimate of the *standard error for the difference* in the two rates according to the formula

$$\sigma_{DIFF} = \sqrt{r_{ILEC} \left[ \frac{1}{denom_{CLEC}} + \frac{1}{denom_{ILEC}} \right]}$$

4. Compute the test statistic

$$z = \frac{DIFF}{\sigma_{DIFF}}$$

5. Determine a critical value  $c$  so that the type one error is suitably small.
6. Declare the means to be in violation of parity if  $z > c$ .

### Example

c:		3.58	Critical value for the test				
ILEC			CLEC			Test	
num	den	rate	num	den	rate	z	Violation
250	610	0.409836	34	30	1.133333	6.04	YES!



## APPENDIX TWO

**STATE OF NEW YORK DEPARTMENT OF PUBLIC SERVICE**

**THREE EMPIRE STATE PLAZA, ALBANY, NY 12223-1350**

Internet Address: <http://www.dps.state.ny.us>

**PUBLIC SERVICE COMMISSION**

JOHN F. OMARA  
Chairman  
MAUREEN O. HELMER  
Deputy Chairman  
THOMAS J. DUNLEAVY  
JAMES D. BENNETT



LAWRENCE G. MALONE  
General Counsel

JOHN C. CRARY  
Secretary

March 6, 1998

To potential bidders:

The New York State Department of Public Service is seeking a vendor to conduct an evaluation of Bell Atlantic New York's operational support systems (OSS). The evaluation will encompass the development of a specific testing plan, and execution of that plan. The attached Request for Proposal (RFP) outlines the scope of this project.

Vendors interested in responding to this RFP must submit 15 copies of their proposal by March 23, 1998. Your proposal, all communications, and any specific questions should be directed to Mr. John Rubino, Office of Utility Efficiency and Productivity, 3 Empire State Plaza, Albany, New York 12223-1350 (518) 473-7157.

Sincerely,

Thomas G. Dvorsky, Director  
Office of Utility Efficiency  
& Productivity

Enclosure

# **Request for Proposal to Perform an Evaluation of the OSS Interface Systems Offered by Bell Atlantic New York**

## **I. Overview**

1. As articulated in a number of Federal Communications Commission (FCC) Orders,<sup>1</sup> the Telecommunications Act of 1996 (the Act)<sup>2</sup> requires Bell Atlantic New York (BA-NY) to provide nondiscriminatory access to its operations support systems (OSSs) on appropriate terms and conditions, to provide the documentation and support necessary for competitive local exchange carriers (CLECs) to access and use these systems, and to demonstrate that BANY's systems are operationally ready and provide an appropriate level of performance. Compliance with these requirements will allow competitors to, among other things, obtain pre-ordering information, submit service orders for resold services and unbundled network elements (UNEs), submit trouble reports, and obtain billing information. BANY offers various systems, including both application-to-application interfaces and terminal-type/Web-based systems, that CLECs can use to access BANY's OSSs and thereby perform such tasks. The New York State Department of Public Service (DPS) has been considering the matter of BA-NY's compliance with the requirements of §271 of the Act in the context of Case 97-C-0271 (Petition of New York Telephone Company for Approval of its Statement of Terms and Conditions Pursuant to Section 252 of the Telecommunications Act of 1996 and Draft Filing of Petition for InterLATA Entry Pursuant to Section 271 of the Telecommunications Act of 1996). The DPS is seeking to retain consultants to assist it in assessing whether BANY is meeting these requirements.

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<sup>1</sup> See In re Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, First Report and Order, FCC 96-325 (rel. Aug. 8, 1996) ("Local Competition Order"); In re Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, Second Order on Reconsideration, FCC 96-476 (rel. Dec. 13, 1996); In re Application of Ameritech Michigan Pursuant to Section 271 of the Communications Act of 1934, as amended, to Provide In-Region, InterLATA Services in Michigan, CC Docket No. 97-137, Memorandum Opinion and Order, FCC 97-298 (rel. Aug. 19, 1997) ("Michigan Order"); In re Application of BellSouth Corporation, et al. Pursuant to Section 271 of the Communications Act of 1934, as amended, to Provide In-Region, InterLATA Services in South Carolina, CC Docket No. 97-208, Memorandum Opinion and Order, FCC 97-418 (rel. Dec. 24, 1997) ("South Carolina Order"). For information on how to find these decisions, as well as related 271 evaluations of the U.S. Department of Justice, on the WWW, see the Additional Information section at the end of this RFP.

<sup>2</sup> Pub. L. No. 104-104, 110 Stat. 56 (1996).

## **II. Background**

### **A. Telecommunications Act of 1996**

1. To effectuate its goal of opening all telecommunications markets to competition, the Telecommunications Act of 1996 requires incumbent local exchange carriers (ILECs), such as BA-NY, to permit interconnect of their networks with the networks of competing local telephone service providers (the CLECs), to offer their retail telecommunications services for resale at wholesale rates, and to provide non-discriminatory access to elements within their networks on an unbundled basis ("unbundled network elements") so that CLECs can use such elements to provide local telephone services. The Act thus contemplates competitive entry into local telephone markets through three paths: resale of ILEC services, the use of unbundled network elements, and full facilities-based entry. These paths are not mutually exclusive: a CLEC may use more than one of these paths in entering any particular local market.

3. Before providing certain interLATA services within the area served by its local telephone companies, the Telecommunications Act requires a Bell Operating Company (BOC), such as Bell Atlantic, to apply to the FCC for authority to do so. The Act provides for the removal of this in-region interLATA restriction within a particular state through the granting of such authority upon a finding by the FCC that the BOC has met several statutory conditions, including compliance with a fourteen-point "competitive checklist" and a showing that the BOC's entry into the interLATA market in that state would be in the public interest. In reviewing a BOC application to determine whether the BOC meets these statutory conditions, the FCC is required to consult with the U.S. Department of Justice and give "substantial weight" to its assessment of the BOC's application for in-region interLATA entry. The FCC is also required to consult with the public service commission of the state that is the subject of the application to verify that the BOC has met certain requirements, including compliance with the competitive checklist.

### **B. OSS Requirements**

4. The term "operations support systems" refers generally to the systems, information, and personnel that support a telecommunications carrier's network elements and services. These systems are essential to its ability to administer its telecommunications network and provide services to consumers. As indicated above, the Telecommunications Act requires BOCs to provide CLECs with nondiscriminatory OSS access. Accordingly, BOCs must put in place appropriate electronic systems and interfaces and related manual processes to allow CLECs to access BOC OSS functions and thus, among other things, obtain pre-ordering information, submit service orders for resold services

and unbundled network elements (UNEs), submit trouble reports, and obtain billing information. Compliance with these requirements is part of the fourteen-point competitive checklist and thus is a condition of BOC entry into the in-region interLATA market.

5. In several decisions noted above, the FCC has articulated the analysis and standards that it applies in determining whether a BOC is meeting its OSS obligations. The following paragraphs provide an overview of these principles. However, the decisions themselves provide the definitive explanations of the requirements, and persons should consult those decisions for additional information.

6. **Analysis:** The FCC considers whether the access to OSS functions that the BOC provides adequately supports each of the three paths for competitive local entry described above: interconnection, unbundled network elements, and service resale. The FCC thus "seek[s] to ensure that a new entrant's decision to enter the local exchange market in a particular state is based on the new entrant's business considerations, rather than the availability or unavailability of particular OSS functions to support each of the modes of entry." *Michigan Order* ¶ 133. The FCC generally employs a two-part analysis.

7. First, the FCC examines the functionality of and support for the OSS systems and interfaces that a BOC provides to meet its obligation. Here, the FCC considers "whether the BOC has deployed the necessary systems and personnel to provide sufficient access to each of the necessary OSS functions and whether the BOC is adequately assisting competing carriers to understand how to implement and use all of the OSS functions available to them." *Michigan Order* ¶ 136. As to the **functionality** of those systems, the FCC determined that "[f]or those functions that the BOC itself accesses electronically, the BOC must provide equivalent electronic access for competing carriers" and that "the BOC must ensure that its operations support systems are designed to accommodate both current demand and projected demand of competing carriers for access to OSS functions." *Id.* ¶ 137. As to the **support** of those systems, the FCC has made particularly detailed determinations:

A BOC . . . is obligated to provide competing carriers with the specifications necessary to instruct competing carriers on how to modify or design their systems in a manner that will enable them to communicate with the BOC's legacy systems and any interfaces utilized by the BOC for such access. The BOC must provide competing carriers with all of the information necessary to format and process their electronic requests so that these requests flow through the interfaces, the transmission links, and into the legacy systems as

quickly and efficiently as possible. In addition, the BOC must disclose to competing carriers any internal "business rules," including information concerning the ordering codes [including universal service ordering codes ("USOCs") and field identifiers ("FIDs")] that a BOC uses that competing carriers need to place orders through the system efficiently.

*Michigan Order* ¶ 137 (footnotes omitted).

8. Second, the FCC considers whether the OSS systems and interfaces that the BOC has deployed are operationally ready, examining operational evidence to determine whether the functions that the BOC provides to CLECs are actually handling current demand and will be able to handle reasonably foreseeable demand volumes. The FCC has stated that the most probative evidence of operational readiness is actual commercial usage. Although carrier-to-carrier testing, independent third-party testing and internal testing can provide valuable evidence, they are less reliable indicators of actual performance than commercial usage.

*Michigan Order* ¶ 138. The FCC considers whether specific performance standards exist and if they have been adopted by a state commission or agreed upon by the parties; standards adopted by a state commission in an arbitration decision are more persuasive evidence of commercial reasonableness than those unilaterally adopted by the BOC outside its interconnection agreement. *Id.* ¶ 141.

9. *Standard:* In the *Local Competition Order*, the FCC concluded that access to an ILEC's OSSs are critical to a CLEC's ability to use network elements and resale services to compete with the ILEC. The FCC determined that providing access to OSS functions falls within an ILEC's duty under section 251(c)(3) to provide unbundled network elements under terms and conditions that are nondiscriminatory, just, and reasonable, and its duty under section 251(c)(4) to offer resale services without imposing any limitations or conditions that are discriminatory or unreasonable. The FCC concluded that an ILEC must provide CLECs access to OSS functions for pre-ordering, ordering, provisioning, maintenance and repair, and billing that is equivalent to what it provides itself where there is a retail analog (the "parity" standard) and generally must provide network elements, including OSS functions, on terms and conditions that "provide an efficient competitor with a meaningful opportunity to compete" (the "meaningful opportunity to compete" standard).

10. In subsequent decisions, the FCC has reiterated its determinations regarding both the parity and meaningful opportunity to compete standards. *See, e.g., Michigan Order* ¶ 130. Regarding the parity standard, the FCC has clearly stated that parity means equivalent access and that this is to be applied broadly:

For those OSS functions provided to competing carriers that are analogous to OSS functions that a BOC provides to itself in connection with retail service offerings, the BOC must provide access to competing carriers that is equal to the level of access that the BOC provides to itself, its customers or its affiliates, in terms of quality, accuracy and timeliness. We conclude that equivalent access, as required by the Act and our rules, must be construed broadly to include comparisons of analogous functions between competing carriers and the BOC, even if the actual mechanism used to perform the function is different for competing carriers than for the BOC's retail operations.

*Id.* ¶ 139; *see also South Carolina Order* ¶ 98 (quoting the *Local Competition Order*, the FCC stated that, for such analogous OSS functions, "access to OSS functions must be offered such that competing carriers are able to perform OSS functions in 'substantially the same time and manner' as the BOC). The FCC specifically found that this standard of equivalent access applies to the OSS functions associated with pre-ordering, ordering, and provisioning for resale services; repair and maintenance for resale services; and repair and maintenance for UNEs; and measuring daily customer usage for billing purposes. *Michigan Order* ¶ 140. For OSS functions with no retail analog, such as the ordering and provisioning of unbundled network elements, a BOC must demonstrate that the access it provides affords a meaningful opportunity to compete. *Id.* ¶ 141.

11. **Scope:** To determine whether the BOC is meeting its duty to provide nondiscriminatory access to CLECs, the FCC considers all automated and manual processes a BOC uses to provide access to OSS functions. This includes the point of interface (or "gateway") for the CLEC's internal OSSs to interconnect with the BOC; any electronic or manual processing link between that interface and the BOC's internal OSSs (including all necessary back office systems and personnel); and all of the internal OSSs (or "legacy systems") that a BOC uses in providing network elements and resale services to a competing carrier. *Michigan Order* ¶¶ 134-35.

### **III. Purpose/Objective**

12. DPS is seeking a telecommunications systems development, test, and integration vendor to (a) develop a comprehensive test plan that will be used to conduct an evaluation of the BA-NY OSS and OSS interface systems used to provide pre-ordering, ordering, provisioning, maintenance and repair, and billing functions to CLECs and (b) to conduct a detailed test of those systems based

on the designed test plan.<sup>3</sup> The vendor chosen shall work for and under the direction of the DPS staff.

13. The project described in this proposal will be broken into two phases. In the first the vendor will develop the test plan, and in the second the vendor will assess the ease or complexity of developing interface software and test BA-NY's OSS and OSS interface systems with test software developed specifically for these tests. Development of the interface software and other test software will not be part of this bid-the DPS will issue a separate RFP for the development of that software, based on the test plan defined in Phase 1-but, as described below, the vendor will assist DPS staff in preparing this separate RFP. Proposed schedules for each of the phases are outlined below. In the response, the vendor should provide a total fixed-price response to Phase 1, and an estimate clear statement of resources for Phase 2 of the project, and should also break out the price for Phase 1 and Phase 2.

#### **A. Phase 1**

14. The test plan developed in this phase must be sufficient to allow the DPS, by reviewing the results of the specified tests of BA-NY OSS and OSS interfaces (including the development by a third-party vendor of software to emulate CLEC interfaces in order to perform the tests), to determine whether BA-NY's provision of access to OSS functionality enables and supports CLEC entry into the local telecommunications market (through the purchase of resold services and UNEs, both singly and in combinations) meets the legal requirements described above. At a minimum, the test plan will need to address testing of the functionality of multiple OSS and OSS interfaces in a number of different areas and of the operational readiness of these systems and interfaces, focusing on how each function performs under real-world scenarios. The test plan must also include a mechanism for testing the capacity of BA-NY's OSS systems and interfaces to determine whether they can presently support levels of demand that are reasonably foreseeable in a competitive market or whether they can readily be scaled to do so in the future. In developing the test plan, the vendor will need to consult with the DPS, BA-NY, and CLECs planning to provide local services in New York, and any other appropriate organizations.

15. Appendix A provides a high-level outline of criteria for evaluating OSS and OSS interfaces. While not intended as a comprehensive list, it provides a general background as to the types of factors that must be considered in developing a test

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<sup>3</sup> Similar tests by such a vendor may be required following BA-NY's entry into the in-region long distance market to ensure that BA-NY is continuing to meet its OSS obligations.

plan. The purpose of providing Appendix A is to give potential vendors a framework for understanding the factors that must be addressed in the test plan. Once a vendor is selected, the DPS will make its staff available as needed to provide supplemental information and explanation.

16. The vendor will also assist DPS staff in drafting an RFP for the DPS to retain a third-party vendor, the Pseudo-CLEC, that will simulate the actual operations of a CLEC operating in New York State and using the various OSS systems and interfaces. As described below, the Pseudo-CLEC will build the "CLEC interface" associated with each application-to-application interface being tested and will process inquiries and orders through each of the OSS and OSS interfaces being tested.

## **B. Phase 2**

17. This aspect of the evaluation will require the vendor to evaluate the ability of a CLEC, with the available documentation and support from BA-NY, to develop interface systems and software to correctly obtain pre-ordering information, submit orders for resold services and UNEs, submit maintenance and repair requests, and bill their end users and to use the systems and software it develops to provide telecommunications services to its customers. This will include a documented assessment of the relative ease or complexity in creating the interface and of after-market support services such as help desks, hot lines, and account management services. This work will be accomplished in conjunction with the work of the Pseudo-CLEC, as well as actual CLECs that are ready and willing to participate. During the course of this engagement, the vendor should identify any additional areas of improvement that would materially reduce the cost, complexity, and time of this development to the Pseudo-CLEC, CLECs, or BA-NY.

18. The vendor must develop and perform detailed tests of BA-NY's OSS and OSS interfaces based on the test plan designed in Phase 1. The test evaluation in Phase 2 must be more comprehensive than simply testing the interfaces, themselves, as the vendor will also be required to measure other critical aspects of BA-NY's OSS interfaces, such as documentation and resource support provided to CLECs. During the test, the vendor will be expected to fully document all test results, as well as the detailed test methodology, so that any third party can readily and fully ascertain how the tests were performed and how the results were derived. The performance measures will be based upon the service standards approved by the PSC in the Carrier-to-Carrier Service Standards Proceeding (Case 97-C-0139).

## **IV. Specific Deliverables**

## **A. Phase 1**

19. The vendor will be expected to provide an initial detailed test plan document, which shall provide a comprehensive plan to test the relevant BA-NY OSS and OSS interfaces required for BA-NY to provide access to OSS functions in conformance with applicable legal requirements. The test plan document should, at a minimum, address the full breadth of issues addressed in Appendix A and the additional detail provided to the vendor by the DPS once a vendor is selected.

20. Prior to delivery of the final test plan, the DPS will provide the initial test plan document produced by the vendor to BA-NY and to certain CLECs for a one-week comment period. At the end of the comment period, the vendor will be expected to, in consultation with the DPS, perform a revision to the test plan, incorporating reasonable recommended changes and additions to the test plan. The vendor will then be expected to deliver the final test plan document. BA-NY shall have the right to delay the commencement of Phase 2, or to terminate Phase 2, up until such time as the test commences.

## **B. Phase 2**

21. The vendor will be expected to evaluate the ability of a CLEC, with the available documentation and support from BA-NY, to develop OSS interface systems and software for each OSS function and to use such systems and software to provide telecommunications services.

22. The vendor will be expected to perform the tests in full compliance with the test plan produced in Phase 1.

23. At the end of the test, the vendor will be expected to provide a document that includes a report on the test results. This report should provide the results of the test, per the test plan produced in Phase 1, and should specifically provide detail as to where BA-NY has met the requirements specified in the test plan. The report should describe any differences between the access to OSS functions BA-NY provides itself and that which it provides to CLECs and analyze the operational effect of such differences, and make recommendations to rectify such differences. The report should also discuss the vendor's assessment of the relative ease or complexity of creating the interface with the supplied documentation, any additional support required of and provided by BA-NY to create the interface,<sup>4</sup> the

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<sup>4</sup> If such additional support is required or if existing documentation requires improvement, the additions and improvements shall be documented in a useable form and made available to all market participants.

timeliness and level of support provided by after-market support services such as help desks and hot lines, and any additional areas of improvement that would materially reduce the cost, complexity, and time of this development and operation to the Pseudo-CLEC or BA-NY.

24. The vendor will also be expected to provide a supporting document that describes the underlying approach of the tests, describes the methodology used in each of the tests, and lists the test data and results of each test. This supporting document should provide sufficient detail to allow uninvolved third parties to fully understand how the test results were derived.

## **V. Schedule**

25. The DPS proposes the following schedule for the implementation of Phases 1 and 2. Vendor responses may provide their own proposed schedules for Phases 1 and 2, if the vendor feels for any reason that the schedule provided herein is not achievable. If its proposed vendor schedule in the response differs from the schedule herein, the vendor should provide a rational for any such differences.

### **Vendor Selection**

March 6	Issue RFP
March 13	Vendor conference-questions addressed
March 23	Vendor proposals due
March 30-31	Vendor interviews
April 1	Vendor selected

### **Phase I**

May 1	Initial test plan document due
May 8	Comments on test plan due
May 18	Final Phase 1 deliverables due

### **Phase II**

Phase II dates will be set upon the completion of Phase I, with the expectation that Phase II will be completed by July 31, 1998.

## **VI. Proposal Response**

26. Vendors interested in responding to this RFP must submit 15 copies of the response by March 23, 1998, to the DPS. Responses must provide a clear demonstration of the vendor's understanding of the objectives and deliverables of this engagement and illustrate the vendor's approach to meeting these objectives in a timely and comprehensive fashion. The proposal response should include the following:

- a. Detailed description of the vendors qualifications to perform Phases 1 and 2 of this engagement: Vendor should discuss its general experience in building test plans and in performing comprehensive tests of information systems and system interfaces. Vendor should also discuss its specific experience, if any, in building test plans for and in

- testing telecommunications OSS and OSS interfaces.
- b. Detailed response on how the vendor will meet each of the deliverables described for Phases 1 and 2: The vendor should make reference to how its deliverables will test against criteria similar to those specified in Appendix A. The response must include some estimate of required vendor resources, as well as a work break-down schedule for both Phases 1 and 2.
  - c. Details on the engagement team: Vendor must provide name and credentials of the vendor team members who will be involved in both Phase 1 and Phase 2.
  - d. Organizational structure for the engagement: The vendor must provide the structure of its resources that will be involved in the implementation. If this structure differs for Phase 1 and Phase 2, two organizational structures should be provided. The vendor should note which resources in this organizational structure will be dedicated to the project and which resources will be shared. Provide specific personnel that will work on each Phase of this project, their expected time commitment, and credentials. These personnel should be available for pre-selection interviews. For any shared resources, the vendor should specify what percentage of that resource's time will be allocated to the project. If the proposal includes personnel from other organizations, a clear statement of roles, responsibilities, and time allocations should be included.
  - e. Price proposal: The vendor shall provide a not-to-exceed cost in which the cost of professional services and out-of-pocket expenses are separately stated. The proposal must include the current professional fee rates for each individual. The bid shall provide a break-out of the price associated with Phase 1 work and the price associated with Phase 2 work. The vendor should detail any assumptions going into the price bid. The not to exceed price shall be inclusive of all expenses associated with the creation of the deliverables, including travel and incidentals. Payments under the contract will be made according to a negotiated schedule of deliverables, with a significant portion of Phase 1 and 2 payments retained until completion of Phase 2 deliverables. Proposals should identify key milestones for payment.
  - f. Other work: The vendor shall identify each existing contract or other agreement that it has with Bell Atlantic or Bell Atlantic's affiliates and shall describe any work that it or its affiliates are doing or have done for Bell Atlantic or Bell Atlantic's affiliates in the past two years. The vendor shall also identify and describe any work that it or its affiliates are doing or have done for other telecommunications services providers in the past two years.
27. Your proposal, all communications, and any specific questions should be directed to Mr. John Rubino, Office of

Utility Efficiency and Productivity, 3 Empire State Plaza,  
Albany, NY 12223-1350. He can be reached at (518) 473-7157 or  
jjr@dps.state.ny.us.

## **VII. Additional Information**

28. Various FCC orders and Department of Justice evaluations that discuss OSS issues are available on their respective Web sites. See the following Web pages:

[http://www.fcc.gov/ccb/local\\_competition/welcome.html](http://www.fcc.gov/ccb/local_competition/welcome.html)

[http://www.fcc.gov/Bureaus/Common\\_Carrier/in-region\\_applications/](http://www.fcc.gov/Bureaus/Common_Carrier/in-region_applications/)

<http://www.usdoj.gov/atr/statements/index.htm>

In addition, in July 1997, New York Department of Public Service Administrative Law Judge Stein issued a Ruling Concerning The Status Of The Record regarding BA-NY's draft \$271 application. This ruling, as well as other rulings and documents related to the \$271 proceeding and the Carrier-to-Carrier Service Standards Proceeding, can be found on the New York State Public Service Commission's Website at the following address:

<http://www.dps.state.ny.us>

## Appendix A

### Introduction

The Telecommunications Act of 1996 provides for three modes of competitive entry into local telephone markets: interconnection, unbundled network elements, and service resale. As part of a 271 application to provide long distance service in its region, a Bell Operating Company (BOC) must demonstrate that it supports all three modes of entry through appropriate wholesale support processes, including the critical access to OSS functions. This involves support for pre-ordering, ordering, provisioning, maintenance and repair, and billing.

The standards and analysis for determining whether a BOC has met this statutory obligation have been articulated and applied in several prior decisions of the Federal Communications Commission and evaluations of the Department of Justice. In summary, the relevant standards are whether the access provided affords an efficient competitor a meaningful opportunity to compete and whether, as to functions provided to CLECs that are analogous to functions provided to itself in connection with its retail services, whether a BOC provides access to CLECs that is equivalent to that it provides itself. In applying these standards, the FCC and the Department consider the functionality of a BOC systems and the support it provides for them; the operational readiness of the systems; and the performance of those systems.

This document seeks to provide vendors responding to the NYPSC RFP (Request for Proposal to Perform an Evaluation of the OSS Interface Systems Offered by Bell Atlantic New York) a high-level framework of general factors generally considered in evaluating a BOC's OSS, OSS interfaces, and support processes generally. Because it cannot realistically list every function of a BOC's own systems and thus include everything necessary to make a parity showing, this document does not purport to list everything that may be necessary to demonstrate compliance with the relevant legal standards. Rather, its purpose is to provide responding vendors an overview of the breadth of issues that must be addressed as part of the test plan and testing of Bell Atlantic New York's OSS and OSS interfaces.

#### I. GENERAL PRINCIPLES

- A. **Industry Standards:** Whether the BOC has implemented, complies with, and supports applicable industry standards<sup>5</sup>.

1. As to any application area, whether the BOC has

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<sup>5</sup> In the context of this proceeding, BA-NY's implementation and compliance will be measured against the applicable industry standards as they have been implemented in New York.

implemented the most recent version of the most recent industry standard(s) within a reasonable period of time.

2. The primary standards organizations today, all of which are part of the Alliance for Telecommunications Industry Solutions (ATIS), are as follows:
  - a. Carrier Liaison Committee (CLC), including the Ordering and Billing Forum (OBF) and the Network Interconnection and Interoperability Forum (NIIF);
  - b. Telecommunications Industry Forum (TCIF), including the Electronic Communications Implementation Committee (ECIC), Electronic Data Interchange (EDI) Committee, and the Service Order Subcommittee (SOSC); and
  - c. Committee T1, including the T1M1 subcommittee on Internetwork Operations, Administration, Maintenance, & Provisioning.
3. De Facto Standards: Whether the BOC supports interfaces and protocols, that while not adopted by any recognized standards body, have achieved widespread use.

B. ***Application-to-Application Interfaces:*** Whether the BOC provides electronic access to OSS functions via application-to-application interfaces that allow CLECs to tie their OSSs directly to BOC OSSs via these interfaces. (In numerous instances, a BOC will be implementing application-to-application interfaces to comply with and support applicable industry standards.)

C. ***Alternative Interfaces:*** Whether the BOC provides alternative electronics interface for accessing key OSS functions.

1. Some CLECs, at least initially, may not maintain their own internal OSSs for all OSS functional categories or may find that it is not feasible to tie their OSSs to a BOC's OSSs via application-to-application interfaces for some or all OSS functions.
2. In such situations a graphical user interface (GUI) or other terminal-type interface may be the only viable, nondiscriminatory mechanism for certain CLECs to gain access to a BOC's OSSs.

D. ***Support:*** Both with regard to each OSS system and interface offered to CLECs and, more generally, with regard to its support processes generally, whether the BOC provides detailed and accurate documentation,

training, and support.

1. CLEC Implementation Support: Whether the BOC works cooperatively with CLECs at all stages of the development and implementation process, from the development of requirements and specifications to testing and final roll-out.
2. Documentation
  - a. Whether the BOC provides appropriate documentation for its wholesale support processes, including the following:
    - (1) thorough support documentation regarding the implementation and usage of each of its OSS interfaces, *e.g.*, technical reference manuals and user's guides;
    - (2) specifications for instructing CLECs on how to modify or design their systems to communicate with the BOC's interfaces and OSSs, including full documentation of the Applications Programming Interface (API) for all application-to-application interfaces;
    - (3) information necessary to format and process their electronic requests so that these requests flow through the interfaces, the transmission links, and into the legacy systems as quickly and efficiently as possible, including
      - (a) syntactical requirements;
      - (b) internal "business rules";
      - (c) ordering codes, including universal service ordering codes ("USOCs") and field identifiers ("FIDs"), used to identify the different services and features used in offering telecommunications services to customers;
      - (d) other information necessary to enable CLECs to "pre-validate" service orders in a manner equivalent to the system edits and other validity checks performed by BOC service order negotiation systems for their retail service orders.
  - b. Whether the BOC has an established, documented procedure for keeping its

documentation up to date and for disseminating documentation to CLECs.

- c. Whether the BOC provides an electronic method of disseminating documentation and of notifying CLECs that updated documentation is available.

3. System/Interface Changes & Change Management

- a. Whether the BOC has an established, documented change management process for controlling and keeping CLECs and any other interested persons informed of changes to its OSS interfaces and the OSSs underlying those interfaces.
- b. Whether the BOC provides an electronic method of disseminating information regarding such changes.
- c. Whenever it updates an OSS interface, whether to support a new release or version of a standard or for other purposes, whether the BOC maintains backward compatibility for a commercially reasonable period of time.
- d. Whenever it replaces an OSS interface or system, whether the BOC maintains the obsolete interface or system for a commercially reasonable period of time to provide a transition period for users of that interface or system to move to other interfaces or systems.

4. Service Center/Help Desk: Whether the BOC provides one or more service centers, or "help desks," that CLECs can contact for support purposes (such as with questions regarding OSS system or interface specifications, other documentation, or usage), whether the centers have appropriate hours of operation, and whether they centers are adequately staffed terms of the number of persons and their level of expertise.

- E. **Capacity:** Whether the BOC's support processes are able to support customers in reasonably foreseeable quantities or at least are scalable to such a level within a minimal time period.

- 1. "Reasonably foreseeable quantities" means quantities that competitors collectively would ultimately demand in a competitive market where the level of competition was not constrained by any limitations of the BOC's interfaces or support processes or by any other factors that the BOC may

influence.

2. "Minimal time period" means a period that would not artificially limit the growth of competition, i.e., at a pace sufficient "to ensure that a new entrant's decision to enter the local exchange market in a particular state is based on the new entrant's business considerations, rather than the availability or unavailability of particular OSS functions," Michigan Order ¶ 133.
3. Statements regarding CLEC forecasts and evidence of adequate capacity for those projections are not necessarily sufficient. To the extent that CLEC forecasts were constrained by limitations of a BOC's interfaces or support processes or by other impediments to competition, they would not provide a basis for a showing of adequate capacity.
4. An analysis of these issues should account for and discuss demand for the entire region served by the OSSs at issue. Thus, when a BOC deploys region-wide systems, since the capacity of the system to provide service in any state will necessarily be affected by regionwide usage, the analysis should consider its entire region, not merely the particular state for which a 271 application is being filed.

## II. PRE-ORDERING

### A. Application-to-Application Interfaces

1. Whether the BOC provides and supports an application-to-application interface to its OSSs that support pre-ordering functions related to service resale and the provision of network elements.
2. Whether a CLEC can readily integrate this application-to-application pre-ordering interface with the BOC's application-to-application ordering interface so that the CLEC can implement integrated systems for their representatives that provide seamless support of pre-ordering and ordering functions.

### B. Industry Standards: Whether the BOC's pre-ordering interfaces support protocols that will be used in the forthcoming industry standards, CORBA and EDI.

### C. Other General Considerations

1. **Query Response Times:** Whether the BOC's pre-ordering interfaces provide pre-order response in substantially the same time frames as the BOC receives such responses internally for similar

functions.

2. **Data Updates**

- a. Where a BOC uses separate databases for responding to BOC and CLEC pre-ordering queries, whether the databases used for responding to CLEC queries are updated as frequently as the databases used for responding to BOC queries.
- b. Where, instead of providing an application-to-application interface for a particular pre-ordering functions, a BOC provides a database to the CLEC to load into the CLEC's systems and access internally, whether the BOC prepares and delivers to CLECs updates to such databases as frequently as it updates the databases used for responding to BOC queries.

D. **Key Functions**

1. **Address verification:** Whether the BOC provides access to address validation functions and whether responses to CLEC queries contain the same functional information as the BOC has for its own business (for example, if a BOC provides building floor information, *e.g.*, 3d floor, for itself, whether it also provides floor information to CLECs).
2. **Telephone numbers:** Whether the BOC provides access to telephone number request, telephone number reservation, and telephone number cancellation functions, including whether CLECs have functionality equivalent to what the BOC provides itself for its retail business (*e.g.*, if a BOC supports reservation of vanity telephone numbers, whether it also offers this capability to CLECs through the electronic pre-ordering interfaces) and whether the BOC places any greater restrictions on the number or types of telephone numbers that a CLEC can request or reserve than it places on its own ability to request and reserve telephone numbers.
3. **Customer Service Records (CSR):** Whether the BOC provides access to functions for accessing CSRs, including whether the BOC blocks or deletes any portion of the CSR, whether the CSR is provided in parsed or unparsed format, and whether there are any restrictions on the size of a CSR retrievable through an electronic request on a real-time basis.

4. ***Service and product availability:*** Whether the BOC provides access to functions that will allow CLECs to determine the services and products that are available to customers at particular locations, including whether the BOC provides a function for a feature validation request that allows the CLEC to determine what features and services are supported by a given central office switch.
5. ***Due-date reservation and appointment scheduling:*** Whether the BOC provides to due-date request, due-date reservation, due-date cancellation, and appointment scheduling functions. Whether the BOC provides non-discriminatory access to due dates and appointment dates, including whether it draws dates for both BOC and CLEC orders from the same date pool.
6. ***Primary Interexchange Carrier (PIC) list:*** Whether the BOC provides access to the PIC list applicable to a particular switch or telephone number.
7. ***Facility availability:*** To the extent that it provides its retail representatives with information regarding the availability of facilities necessary to fill an order, whether the BOC provides access to functions that give CLECs access to the same information provided to the BOC retail representatives.
8. ***Primary Interexchange Carrier (PIC):*** Whether the BOC provides access to a function that identifies the subscriber's current PIC.
9. ***Directory listing:*** To the extent that BOC subscribers can contact a BOC representative to verify their directory listings, whether the BOC provides access to functions that give CLECs access to the same directory listing information that is provided to the BOC retail representatives.

### III. ORDERING & PROVISIONING

- A. **Application-to-Application Interfaces/Industry Standards:** Whether BOC provides and supports a single application-to-application interface to its OSSs that
  1. supports ordering functions related to service resale and the provision of unbundled network elements;
  2. complies with and supports the applicable ordering standards, presently including the EDI SOSC Version 7.0 EDI specification for ordering of telecommunications services and the OBF Local

Services Ordering Guide Version 2.0, which provides the definition for the Local Service Request (LSR), and the new OBF LSOG Version 3 and TCIF EDI SOSC Version 8; and

3. can be readily integrated with the application-to-application pre-ordering interface so that CLECs can implement integrated systems for their representatives that provide seamless support of pre-ordering and ordering functions.

B. Other General Considerations

1. **Alternative Electronic Interface:** Whether the BOC provides an alternative terminal-type electronic interface, *e.g.*, a Web-based interface, for accessing key ordering functions related to service resale and the provision of network elements and, if so, whether that interface complies with the LSOG guidelines.
2. **Flow-Through:** Whether the BOC provides flow-through for the following local service orders:
  - (1) orders for services as to which there is flow-through for BOC service orders;
  - (2) orders for services that are analogous to services as to which there is flow-through for BOC service orders, *e.g.*, orders for an end-to-end combination of network elements (the "platform"); and
  - (3) orders for individual UNE loops.

C. Key Functions

1. Whether the BOC provides support, through all ordering interfaces offered, for both total services resale (TSR), including vertical features, and the full suite of unbundled network elements (UNEs), including loops, ports, trunks, E911, directory services, and operator services.
2. Whether the BOC provides support for migration-as-specified orders, migration-as-is orders, and new service orders.
3. Whether the BOC provides support for feature changes, service disconnect, service suspend, and move and change activities.
4. Order Status Functions:
  - a. Whether the BOC provides electronic order status capabilities, including firm order confirmation (FOC), order completion notification, order jeopardy notification,

and order rejection notification.

- b. Whether the BOC provides all these electronic notifications through the same single, standards-based application-to-application interface referred to above.
- c. To the extent that a BOC's retail representatives are able to interactively query status or other information about an order, whether the BOC provides CLECs an equivalent capability through its application-to-application and alternative interfaces.

#### IV. MAINTENANCE & REPAIR

- A. Industry Standards/Application-to-Application Interfaces: Whether the BOC has implemented, complies with, and supports the standard interface for trouble administration for local services, the T1M1 standard T1.227 and T1.228 and the additional ECIC implementation guidelines for a trouble administration OSS interconnection system.
- B. Alternative Interface: Whether the BOC provides an alternative terminal-type electronic interface, *e.g.*, a Web-based interface, for trouble administration.
- C. Key Functions
  - 1. Whether each trouble administration interface allows CLECs to place trouble tickets, close out trouble tickets, and receive status on open troubles.
  - 2. Whether each trouble administration interface allows CLECs to perform tests on the services, such as a mechanized loop test (MLT).

#### V. BILLING

- A. Industry Standards: Whether the BOC supports CABS format for wholesale bills and EMI/EMR format for message processing.
  - 1. A BOC should implement billing interfaces that provide billing data for resale and UNEs in these formats to be considered to be conforming to the standards.
- B. Key Functions
  - 1. Whether the BOC provides monthly billing data electronically to CLECs.
  - 2. Whether the BOC provides daily usage feeds to CLECs with information of a sufficient detail for CLECs to prepare end-user bills.



APPENDIX THREE

# STATE OF NEW YORK DEPARTMENT OF PUBLIC SERVICE

THREE EMPIRE STATE PLAZA, ALBANY, NY 12223-1350

Internet Address: <http://www.dps.state.ny.us>

## PUBLIC SERVICE COMMISSION

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JAMES D. BENNETT



LAWRENCE G. MALONE

General Counsel

JOHN C. CRARY

Secretary

May 15, 1998

To Potential Bidders:

The New York State Department of Public Service is seeking a vendor to build an OSS interface to Bell Atlantic New York and execute test transactions through that interface. The attached Request for Proposal (RFP) outlines the scope of this project.

**A bidders informational meeting will be held on Tuesday, May 19, 1998 at the Department of Public Service, 3 Empire State Plaza, Albany, New York, 18th Floor.**

Vendors interested in responding to this RFP must submit 15 copies of their proposal by **May 26, 1998**. Your proposal, all communications, and any specific questions should be directed to Mr. John Rubino, Office of Utility Efficiency and Productivity, 3 Empire State Plaza, Albany, New York 12223-1350, (518) 473-7157.

Sincerely,

Thomas G. Dvorsky, Director  
Office of Utility Efficiency and Productivity

Attachments

# CLEC Test Transaction Generator Request for Proposal

May 15, 1998

## Background

On March 6, 1998, the New York State Department of Public Service (DPS) issued a Request for Proposals (RFP) to retain a consultant to develop a plan designed to test Bell Atlantic New York (BANY) operational support system<sup>1</sup> (OSS) interfaces to be used by new entrants competing in the local exchange market. The Public Service Commission selected KPMG Peat Marwick for this phase (Phase I) of the project. As detailed in the March 6, Phase I RFP,<sup>2</sup> a second part of the project (Phase II) requires that the DPS retain a third-party vendor (CLEC Test Transaction Generator) to build an application-to-application OSS interface and process queries, service order requests and trouble reports through this OSS interfaces. In addition to application-to-application interface testing, the CLEC Test Transaction Generator will process various orders and queries through Bell Atlantic New York's existing Graphical User Interface (Web GUI).

This RFP seeks bids from vendors who will operate as the Test Transaction Generator to perform the work defined herein. The vendor chosen will work for and under the direction of the DPS staff. **The bidders informational meeting will be held on May 19, 1998 at the Department's Offices in Albany, New York (3 Empire State Plaza - 18<sup>th</sup> Floor) commencing at 11:00 AM. Proposals are due Tuesday, May 26, 1998**

## Scope

The scope of the vendor's involvement is to build OSS interfaces based upon documentation and support provided by Bell Atlantic New York and to process various inquiries and orders through this interface as identified by KPMG Peat Marwick. Specifically, the vendor will:

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<sup>1</sup> The term "operations support systems," or OSS, refers generally to the systems, information, and personnel that support a telecommunications carrier's network elements and services. These systems are essential to its ability to administer its telecommunications network and provide services to consumers. As indicated above, the Telecommunications Act requires Bell Operating Companies (BOCs) to provide CLECs nondiscriminatory OSS access. Accordingly, BOCs must put in place appropriate electronic systems and interfaces and related manual processes to allow CLECs to access BOC OSS functions and thus, among other things, obtain pre-ordering information, submit service orders for resold services and unbundled network elements (UNEs), submit trouble reports, and obtain billing information. Compliance with these requirements is part of the fourteen-point competitive checklist and thus is a condition of BOC entry into the in-region interLATA market.

<sup>2</sup> The March 6, 1998 Request for Proposal can be found at the New York State Department of Public Service homepage at [www.dps.state.ny.us/tel271.htm](http://www.dps.state.ny.us/tel271.htm)

- 1) Using BANY provided parsing rules, develop the ability to parse BANY CSR data so that pre-ordering can be tested at anticipated volumes in full integration with ordering OSS. All knowledge gained through this process will be communicated to interested CLECs in a timeframe and fashion that will allow CLECs to parse data during the execution of testing functions.
- 2) Build an application to application OSS interface (based upon baseline documentation<sup>3</sup> provided by BANY that can support transactions associated with preordering, service ordering, provisioning, repair and maintenance,<sup>4</sup> and billing.
- 3) Document the relative ease or complexity of creating the interfaces from the BANY supplied baseline documentation and document and inventory any additional documentation and/or support required of and provided by BANY to create the interface.
- 4) At the direction of the Test Manager, construct and electronically submit various forms<sup>5</sup> associated with Local Service Requests (LSRs), End Users (EU), Loop Service (LS), Local Service with Number Portability (LSNP), Number Portability (NP), Port Service (PS) Requests, Directory Listing Information (DL) and Access Service Requests (ASRs) for specific services being ordered through BANY's EDI, NDM or FTS interface.
- 5) Construct and electronically submit service order requests (for resale, unbundled elements and platform), queries, associated trouble reports and other transactions through BANY's Web GUI, the type and volume to be determined by KPMG Peat Marwick.
- 6) Receive various BANY confirmations, jeopardy notices, completion notices and responses back from querying the various OSS functions.
- 7) For any transaction or series of transactions, construct the capability to follow the sequence of transactions and responses to a logical end using in-place business processes. For those transactions/responses which require a manual response transaction (e.g. exception processing) from the Test Transaction Generator, accumulate the responses into

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<sup>3</sup> For unbundled elements and platform orders, the "baseline" documentation provided will be the information agreed to by Bell Atlantic New York and the CLECs in the Commission's OSS UNE Collaborative and is more fully discussed below. Additional documentation relative to resale orders will be provided as well.

<sup>4</sup> For purposes of this test, the electronic gateway for activities associated with trouble reporting will not be an application-to-application, but rather will be the Repair Trouble Administration System (RETAS). This system will be accessed via the Bell Atlantic New York Graphical User Interface (Web GUI).

<sup>5</sup> To verify the vendor's understanding of the preservice, ordering, provisioning and trouble report creation rules and process, the vendor will be required to provide to KPMG, the Department of Public Service and BANY, preservice and service order LSRs/ASRs along with other sample electronic transactions in advance of the testing.

an archive and provide to the Test Manager to manually complete these scenarios. The Test Transaction Generator should have the capability to accept resolved exceptions from the Test Manager and continue processing the sequence of transactions to their logical end.

- 8) Build the capacity to electronically capture, archive and transmit via electronic means and other data storage media (i.e., 3.5 inch diskette or CD ROM) in a specified file layout all timestamped data in a manner which uniquely identifies each transaction with its appropriate timestamp, matched to the transactions appropriate response(s) with its (their) associated timestamp(s).
- 9) Build the capability to deliver and receive a volume of transactions, including but not limited to Local Service Order Requests and Maintenance Requests that can be submitted to allow stress testing of the BANY wholesale systems and processes.
- 10) Document hardware, software and communications capabilities used to process electronic transactions.
- 11) Document all test results (including response times,<sup>6</sup> error rates and performance) to allow the performance to be evaluated based upon the interim service standards approved by the Public Service Commission in the Carrier-to-Carrier Service Standards Proceeding (Case 97-C-0139).<sup>7</sup> (See Attachment A)
- 12) Document an acceptance test plan for the CLEC Test Transaction Generator.

#### **Resources Available to the Vendor**

Information and support will be provided to the vendor to "build" the OSS interface and to "execute" the test plan.

#### **Building the Interface**

To "build" the OSS interface the New York State Department of Public Service will provide the vendor with baseline documentation. This documentation will consist of the baseline documentation agreed to by the parties in the Commission's OSS UNE Collaborative for unbundled elements and platform transactions and additional documentation relating to resale ("resale documentation"). Such documentation will include, but is not limited to:

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<sup>6</sup> Every message between the Test Generator and the BANY systems needs to be date/time stamped to provide information for performance measurements. While such date/time stamps may be conducted by BANY, it is expected that the vendor will date/time stamp the transmission and receipt of every message to allow an independent analysis.

<sup>7</sup> As detailed in BANY's April 6, 1998 Pre-Filing Statement (see Page 33), BANY has committed to provide a level of performance which is, at a minimum, equivalent to that specified in the interim carrier-to-carrier service standards developed in the context of Case 97-C-0139. A copy of the Bell Atlantic New York Prefiling Statement can be found on the Bell Atlantic homepage at: <http://www.bell-atl.com>

- a) EDI8/LSOG2 for Resale, UNE and Platform Orders;
- b) EDI9/LSOG3 for Pre-Service Order requests for Resale and UNE;
- c) The Collaborative Issues Matrix that provides the agreed upon resolutions of issues. These resolutions clarify certain business rules and ordering processes for LSR and ASR data fields; and,
- d) Bell Atlantic New York CLEC Handbooks.

In addition to this information, Bell Atlantic New York will provide:

- a) Support functions similar to those provided to large CLECs entering the New York State local market to aide in all aspects of their market entry;
- b) A BANY Account Manager. The Account Manager responsibilities are included as Attachment B;
- c) A set of Billing Telephone Numbers (BTNs) representing test accounts that can be used for the test along with test account Customer Service Records (CSRs); and,
- b) Access to BANY's Wholesale System as a registered CLEC.

#### Executing the Test Plan

To "execute" the test transactions through the OSS interface, the vendor will be provided the test plan that will identify the unique transactions that need to be executed. The test plan will identify the type and quantity of unique transaction requests that represent reasonably foreseeable volumes and mixes to be executed during the capacity test. For the stress and volume portions of the test, the vendor will process transactions and responses through an automated interface. However, the vendor will have to provide personnel to provide support for items such as error/reject follow-up and correction. For those transactions/responses requiring manual responses/transactions (e.g., exception processing), the vendor will accumulate BANY responses into an archive which is sent to the Phase II Test Manager for analysis. The Phase II Test Manager will direct the CLEC Test Transaction Generator in the running of these tests. This Phase II Test Manager will be identified by the DPS.

For functionality testing, the vendor will provide hardware and software (and support) to create a "business office" environment. This "business office" may be staffed by resources obtained from the industry by the Department of Public Service.

#### **The Proposal**

Vendors interested in responding to this RFP must submit 15 copies of the response by May 26, 1998 to the DPS. Responses must provide a clear demonstration of the vendor's understanding of the objectives and deliverables of this engagement and illustrate the vendor's approach to meeting these objectives in a timely and comprehensive fashion. The proposal response should include the following:

1. Detailed description of the vendors qualifications to perform the CLEC Test Transaction Generator functions. Vendor should discuss its general experience in

building electronic interfaces and performing comprehensive tests of information systems and system interfaces. Vendor should also discuss its specific experience, if any, in building and in testing telecommunications OSS interfaces.

2. Details on the engagement team. Vendor must provide name and credentials of the specific vendor team members who will be involved.
3. Organizational structure for the engagement. The vendor must provide the structure of how its resources will be involved in the project (including the time and unit price).
4. Price proposal. The vendor shall provide a fixed price bid for the project. The vendor should detail any assumptions going into the price bid. The fixed price shall be inclusive of all expenses associated with the creation of the deliverables, including travel and incidentals. Payments under the contract will be made according to a negotiated schedule of deliverables, with a significant portion retained until completion of execution of the test. Proposals should identify key milestones for payment.
5. A detailed description of any existing contracts or agreements with Bell Atlantic New York (and the former NYNEX) or its affiliates and define any work it or its affiliates have done for Bell Atlantic New York (and the former NYNEX) or its affiliates in the past two years.
- 6) Full disclosure of any and all discussions between the vendor and any Bell Atlantic representative and any documents or correspondence related to the following:
  - a) Bell Atlantic OSS or legacy systems
  - b) The testing or validation of OSS or legacy systems.

Your proposal, all communications, and any specific questions should be directed to John Rubino, Office of Utility Efficiency and Productivity, at the DPS's Albany Offices. He can be reached at (518) 473-7157 or JJR@dps.state.ny.us.

#### **Schedule**

The DPS proposes the following schedule for this phase (Phase II) of the project. If a bidder wishes to propose a different schedule, please include a full justification including milestones.<sup>8</sup>

May 15, 1998	Issue RFP
May 19, 1998	Bidders Meeting (Albany, New York)
May 26, 1998	Vendor proposals due

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<sup>8</sup> This schedule assumes that BANY has in place all functionalities, definitions and, business rules necessary for the test.

June 1, 1998	Vendor selected & provided baseline documentation
July 31, 1998	Testing of vendor systems concluded
August 1, 1998	Execution of Test Plan Begins

**Attachments**

- A) New York DPS Interim Carrier-to-Carrier Service Standards
- B) Bell Atlantic New York "Account Manager Responsibilities"

**Relevant Information on the Internet**

- 1) NYS Department of Public Service homepage: [www.dps.state.ny.us](http://www.dps.state.ny.us) (Contains the DPS March 6, 1998 Phase I RFP on the Project)
- 2) Bell Atlantic New York homepage: [www.bell-atl.com](http://www.bell-atl.com) (contains the Bell Atlantic New York April 6, 1998 Prefiling Statement)

C

# Local Competition Users Group

## Statistical Tests for Local Service Parity

February 6, 1998

Membership: AT&T, Sprint, MCI, LCI, WorldCom

Version 1.0

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## **Executive Summary**

The Local Competition Users Group has drafted 27 Service Quality Measurements (SQMs) that will be used to measure parity of service provided by incumbent local exchange carriers (ILECs) to competitive local exchange carriers (CLECs). This set of measures includes means, proportions, and rates of various indicators of service quality. This document proposes statistical tests that are appropriate for determining if parity is being provided with respect to these measurements.

Each month, a specified report of the 27 SQMs will be provided by the ILEC, broken down by the requested reporting dimensions. The SQMs are to be systematically developed and provided by the ILECs as specified. Test parameters will be calculated so that the overall probability of declaring the ILEC to be out of parity purely by chance is very small. For each SQM and reporting dimension reported, the difference between the ILEC and CLEC results is converted to a z-value. Non-parity is determined if a z-value exceeds a selected critical value.

## Introduction

### *Purpose*

The Local Competition Users Group (LCUG) is a cooperative effort of AT&T, MCI, Sprint, LCI and WorldCom for establishing standards for the entry of new companies (competitive local exchange carriers, or CLECs) into the local telecommunications market. A key initiative of the LCUG is to establish measures of parity for services provided by incumbent local exchange carriers (ILECs). In short, parity means that the support ILECs provide on behalf of the CLECs is no lesser in quality than the service provided by the ILECs to their own customers.

The LCUG has drafted a document listing service quality measurements (SQMs) that must be reported by the ILECs to insure that CLECs are given parity of support. The SQM document has been submitted to the FCC and made available to PUCs in all 50 states and is pending approval by many of these regulatory agencies. This document has been drafted to describe statistical methodology for determining if parity exists based on the measurements defined in the SQM document.

### *Service Quality Measurements*

The LCUG has identified 27 service quality measurements for testing parity of service. These are:

Category	ID	Description
Pre-Ordering	PO-1	Average Response Interval for Pre-Ordering Information
Ordering and Provisioning	OP-1	Average Completion Interval
	OP-2	Percent Orders Completed on Time
	OP-3	Percent Order Accuracy
	OP-4	Mean Reject Interval
	OP-5	Mean FOC Interval
	OP-6	Mean Jeopardy Interval
	OP-7	Mean Completion Interval
	OP-8	Percent Jeopardies Returned
	OP-9	Mean Held Order Interval
	OP-10	Percent Orders Held >= 90 Days
	OP-11	Percent Orders Held >= 15 Days
Maintenance and Repair	MR-1	Mean Time to Restore
	MR-2	Repeat Trouble Rate
	MR-3	Trouble Rate
	MR-4	Percentage of Customer Troubles Resolved Within Estimate
General	GE-1	Percent System Availability
	GE-2	Mean Time to Answer Calls
	GE-3	Call Abandonment Rate
Billing	BI-1	Mean Time to Provide Recorded Usage Records
	BI-2	Mean Time to Deliver Invoices
	BI-3	Percent Invoice Accuracy
	BI-4	Percent Usage Accuracy

Operator Services and Directory Assistance	OSDA-1	Mean Time to Answer
Network Performance	NP-1	Network Performance Parity
Interconnect / Unbundled Elements and Combos	IUE-1	Function Availability
	IUE-2	Timeliness of Element Performance

The Service Quality Measurements document describes the importance of each measure as an indicator of service parity. The SQM document also describes reporting dimensions that will be used to break each measure out by like factors (*e.g.*, major service group).

### ***Why We Need to Use Statistical Tests***

The Telecommunications Act of 1996 requires that ILECs provide nondiscriminatory support regardless of whether the CLEC elects to employ interconnection, services resale, or unbundled network elements as the market entry method. It is essential that CLECs and regulators be able to determine whether ILECs are meeting these parity and nondiscriminatory obligations. In order to make such a determination, the ILEC's performance for itself must be compared to the ILEC's performance in support of CLEC operations; and the results of this comparison must demonstrate that the CLEC receives no less than equal treatment compared to that the ILEC provides to its own operations. Where a direct comparison to analogous ILEC performance is not possible, the comparative standard is the level of performance that offers an efficient CLEC a meaningful opportunity to compete.

When making the comparison of ILEC results to CLEC results, it is necessary to employ comparative procedures that are based upon generally accepted statistical procedures. It is important to use statistical procedures because all of the ILEC-CLEC processes that will be measured are processes that contain some degree of randomness. Statistical procedures recognize that there is measurement variability, and assist in translating results data into useful decision-making information. A statistical approach allows for measurement variability while controlling the risk of drawing an inappropriate conclusion (*i.e.*, a "type 1" or "type 2" error, discussed in the next section).

## **Basic Concepts and Terms**

### ***Populations and Samples***

Statistical procedures will permit a determination whether the support that the ILECs provide to CLECs is indistinguishable from the support provided by the ILECs to their own customers. In statistical terms, we will determine whether two "samples", the ILEC sample and the CLEC sample, come from the same "population" of measurements.

The procedures described in this paper are based on the following assumption: *When parity is provided, the ILEC data and CLEC data can both be regarded as samples from a common*

*population of possible outcomes.* In other words, if parity exists, the measured results for a CLEC should not be distinguishable from the measured results for the ILEC, once random variability is taken into account. Figure 1 illustrates this concept. On the right side of the figure are histograms of two samples. In this illustration, the ILEC sample contains 200 observations (data values) and the CLEC sample contains 50. Note that the two histograms are not exactly alike. This is due to sampling variation. The assumption that parity exists implies that both samples were drawn from the same population of values. If it were possible to observe this population completely, the population histogram might appear as shown on the left of the Figure. If the samples were indeed taken from this population, histograms drawn for larger and larger samples would look more and more like the population histogram. Figure 1 shows that even when parity is being provided, there will be differences between the samples due to sampling variability. Statistical tests quantify the differences between the two samples and make proper allowance for sampling variability. They assess the chance that the differences that are observed are due simply to sampling variability, if parity is being provided.

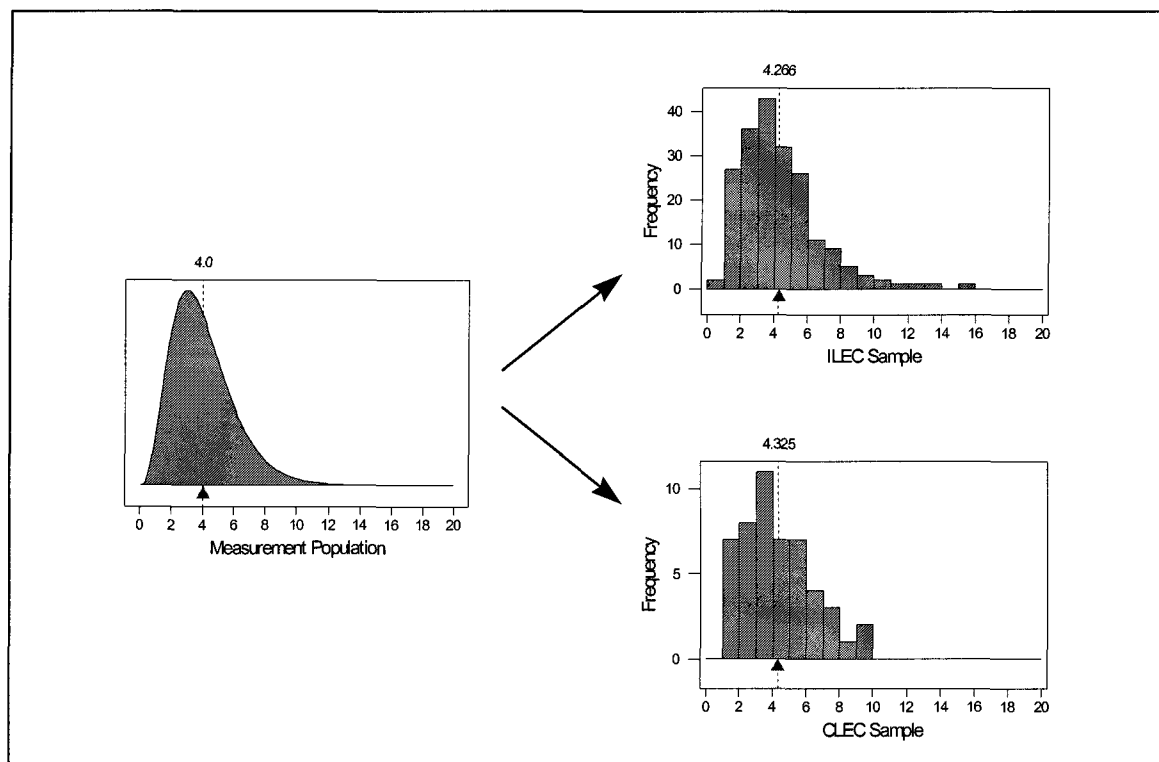


Figure 1.

## **Measures of Central Tendency and Spread**

Often, distributions are summarized using "statistics." For the purpose of this paper, a "statistic" is simply a calculation performed on a sample set of data. Two common types of statistics are known as measures of "central tendency" and "spread."

A measure of central tendency is a summary calculation that describes the middle of the distribution in some way. The most common measure of central tendency is called the "mean" or "average" of the distribution. The mean of a sample is simply the sum of the data values divided by the sample size (number of observations). Algebraically, this calculation is expressed as

$$\bar{x} = \frac{\sum x}{n},$$

where  $x$  denotes a value in the sample and  $n$  denotes the sample size. The mean describes the center of the distribution in the following way: *If the histogram for a sample were a set of weights stacked on top of a flat board placed on top of a fulcrum (a "see-saw"), the mean would be the position along the board at which the board would balance.* (See Figure 1.) The mean in Figure 1 is indicated by the small triangle at approximately the value "4" on the horizontal axis.

A measure of spread is a summary calculation that describes the amount of variation in a sample. A common measure of spread is called the "standard deviation" of the sample. The standard deviation is the typical size of a deviation of the observations in the sample from their mean value. The standard deviation is calculated by subtracting the mean value from each observation in the sample, squaring the resulting differences (so that negative and positive differences don't offset), summing the squared differences, dividing the sum by one less than the sample size, then taking the square root of the result. Algebraically, this calculation is expressed as

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}.$$

While the notion of mean and standard deviation exists for populations as well as samples, the mathematical definition for the mean and standard deviation for populations is beyond the scope of this paper. However, their interpretation is generally the same as for samples. In fact, for very large samples, the sample mean and sample standard deviation will be very close to the mean and standard deviation of the population from which the sample was taken.

## **Sampling Distribution of the Sample Mean**

In Figure 1 we showed the positions of the means of the population and the two samples with triangular symbols beneath the distributions. If we sample over successive months, we will get new ILEC samples and new CLEC samples each and every month. These samples will not be exactly like the one for the first month; each will be influenced by sampling variability in a

different way. In Figure 2, we show how sets of 100 successive ILEC means and 100 successive CLEC means might appear. The ILEC means can be thought of as being drawn from a population of sample means; this population is called the "sampling distribution" of these ILEC means. This sampling distribution is completely determined by the basic population of measurements that we start with, and the number of observations in each sample. The sampling distribution has the same mean as the population.

Figure 2 illustrates two important statistical concepts:

1. The histogram of successive sample means resembles a bell-shaped curve known as the Normal Distribution. This is true even though the individual observations came from a skewed distribution.
2. The standard deviation of the distribution of sample means is much smaller than the standard deviation of the observations themselves. In fact, statistical theory establishes the fact that the standard deviation on the population of means is smaller by a factor  $\sqrt{n}$ , where  $n$  is the sample size. This effect can be seen in our example: the distribution of the CLEC means is twice as broad as the distribution of the ILEC means, since the ILEC sample size (200) is four times as large as the CLEC sample size (50).

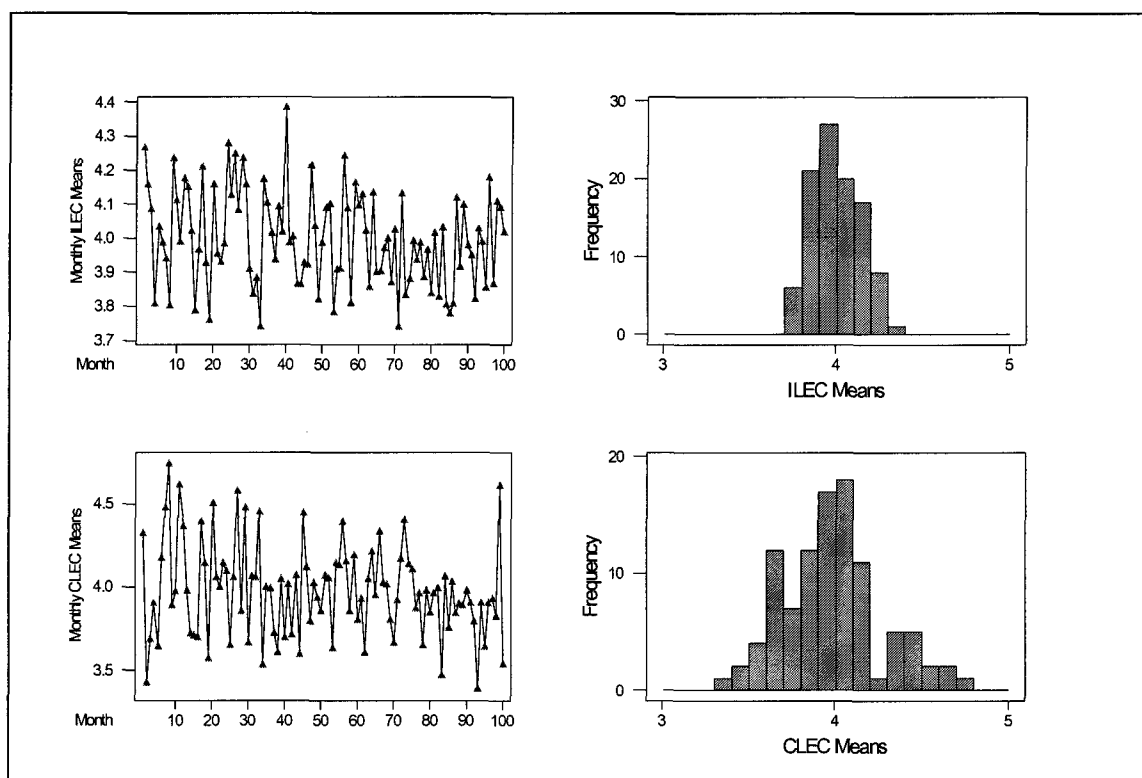


Figure 2.

It is common to call the standard deviation of the sampling distribution of a statistic the "standard error" for the statistic. We shall adopt this convention to avoid confusion between the standard deviation of the individual observations and the standard deviation (standard error) of the statistic. The latter is generally much smaller than the former. In the case of sample means, the standard

error of the mean is smaller than the standard deviation of the individual observations by a factor of  $\sqrt{n}$ .

### **The Z-test**

Our objective is to compare the mean of a sample of ILEC measurements with the mean of a sample of CLEC measurements. Suppose both samples were drawn from the same population; then the difference between these two sample means (*i.e.*,  $DIFF = \bar{x}_{CLEC} - \bar{x}_{ILEC}$ ) will have a sampling distribution which will

- (i) have a mean of zero; and
- (ii) have a standard error that depends on the population standard deviation and the sizes of the two samples.

Statisticians utilize an index for comparing measurement results for different samples. The index employed is a ratio of the difference in the two sample means (being compared) and the standard deviation estimated for the overall population. This ratio is known as a z-score. The z-score compares the two samples on a standard scale, making proper allowance for the sample sizes.

The computation of the difference in the two sample means is straightforward.

$$DIFF = \bar{x}_{CLEC} - \bar{x}_{ILEC}$$

The standard deviation is less intuitive. Nevertheless, statistical theory establishes the fact that

$$\sigma_{DIFF}^2 = \frac{\sigma^2}{n_{CLEC}} + \frac{\sigma^2}{n_{ILEC}},$$

where  $\sigma$  is the standard deviation of the population from which both samples are drawn. That is, the squared standard error of the difference is the sum of the squared standard errors of the two means being compared.<sup>1</sup>

We do not know the true value of the population  $\sigma$ , because the population cannot be fully observed. However, we can estimate  $\sigma$  given the standard deviation of the ILEC sample ( $\sigma_{ILEC}$ ).<sup>2</sup> Hence, we may estimate the standard error of the difference with

$$\sigma_{DIFF} = \sqrt{\frac{\sigma_{ILEC}^2}{n_{CLEC}} + \frac{\sigma_{ILEC}^2}{n_{ILEC}}} = \sqrt{\sigma_{ILEC}^2 \left[ \frac{1}{n_{CLEC}} + \frac{1}{n_{ILEC}} \right]}$$

<sup>1</sup> Winkler and Hays, *Probability, Inference, and Decision*. (Holt, Rinehart and Winston: New York), p. 370.

<sup>2</sup> Winkler and Hays, *Probability, Inference, and Decision*. (Holt, Rinehart and Winston: New York), p. 338.

If we then divide the difference between the two sample means by this estimate of the standard deviation of this difference, we get what is called a "z-score".

$$z = \frac{DIFF}{\sigma_{DIFF}}$$

Because we assumed that both samples were in fact drawn from the same population, this *z*-score has a sampling distribution that is very nearly Standard Normal, *i.e.*, having a mean of zero and a standard error of one. Thus, the *z*-score will lie between  $\pm 1$  in about 68% of cases, will lie between  $\pm 2$  in about 95% of cases, and will lie between  $\pm 3$  in about 99.7% of cases, always assuming that both samples come from the same population. Therefore, one possible procedure for checking whether both samples come from the same population is to compare the *z*-score with some cut-off value, perhaps +3. For comparisons where the values of *z* exceed the cutoff value, you reject the assumption of parity as not proven by the measured results. This is an example of a statistical test procedure. It is a formal rule of procedure, where we start with raw data (here two samples, ILEC measurements and CLEC measurements), and arrive at a decision, either "conformity" or "violation".

### ***Type 1 Errors and Type 2 Errors***

Each statistical test has two important properties. The first is the probability that the test will determine that a problem exists when in fact there is none. Such a mistaken conclusion is called a type one error. In the case of testing for parity, a type one error is the mistake of charging the ILEC with a parity violation when they may not be acting in a discriminatory manner. The second property is the probability that the test procedure will not identify a parity violation when one does exist. The mistake of not identifying parity violation when the ILEC is providing discriminatory service is called a type two error. A balanced test is, therefore, required.

From the ILEC perspective, the statistical test procedure will be unacceptable if it has a high probability of type one errors. From the CLEC perspective, the test procedure will be unacceptable if it has a high probability of type two errors.

Very many test procedures are available, all having the same probability of type one error. However the probability of a type two error depends on the particular kind of violation that occurs. For small departures from parity, the probability of detecting the violation will be small. However, different test procedures will have different type two error probabilities. Some test procedures will have small type two error when the CLEC mean is larger than the ILEC mean, even if the CLEC standard deviation is the same as the ILEC standard deviation, while other procedures will be sensitive to differences in standard deviation, even if the means are equal. Our proposals below are designed to have small type two error when the CLEC mean exceeds the ILEC mean, whether or not the two variances are equal.

## Tests of Proportions and Rates

When our measurements are proportions (e.g. percent orders completed on time) rather than measurements on a scale, there are some simplifications. We can think of the "population" as being analogous to an urn filled with balls, each labeled either 0(failure) or 1(success). In this population, the fraction of 1's is some "population proportion". Making an observation corresponds to drawing a single ball from this urn. Each month, the ILEC makes some number of observations, and reports the ratio of failures or successes to the total number of observations; the ILEC does the same for the CLEC. The situation is very similar to that discussed above; however, rather than a wide range of possible result values, we simply have 0's (failures) and 1's (successes). The "sample mean" becomes the "observed proportion", and this will have a sampling distribution just as before. The novelty of the situation is that now the population standard deviation is a known function of the population proportion<sup>3</sup>; if the population proportion is  $p$ , the population standard deviation is  $\sqrt{p(1 - p)}$ , with similar simplifications in all the other formulas.

There is a similar simplification when the observations are of rates, e.g., number of troubles per 100 lines. The formulas appear below.

## Proposed Test Procedures

### Applying the Appropriate Test

Three z-tests will be described in this section: the "Test for Parity in Means", the "Test for Parity in Rates", and the "Test for Parity in Proportions". For each LCUG Service Quality Measurement (SQM), one or more of these parity tests will apply. The following chart is a guide that matches each SQM with the appropriate test.

<i>Measurement (Corresponding LCUG Number)</i>	<i>Test</i>
Preordering Response Interval (PO-1)	<b>Mean</b>
Avg. Order Completion Interval (OP-1)	<b>Mean</b>
% Orders Completed On Time (OP-2)	<b>Proportion</b>
% Order (Provisioning) Accuracy (OP-3)	<b>Proportion</b>
Order Reject Interval (OP-4)	<b>Mean</b>
Firm Order Confirmation Interval (OP-5)	<b>Mean</b>
Mean Jeopardy Interval (OP-6)	<b>Mean</b>
Completion Notice Interval (OP-7)	<b>Mean</b>
Percent Jeopardies Returned (OP-8)	<b>Proportion</b>
Held Order Interval (OP-9)	<b>Mean</b>
% Orders Held $\geq$ 90 Days (OP-10)	<b>Proportion</b>
% Orders Held $\geq$ 15 Days (OP-11)	<b>Proportion</b>
Time To Restore (MR-1)	<b>Mean</b>

<sup>3</sup> Winkler and Hays, *Probability, Inference, and Decision*. (Holt, Rinehart and Winston: New York), p. 212.

Repeat Trouble Rate (MR-2)	Proportion
Frequency of Troubles (MR-3)	Rate
Estimated Time To Restore (MR-4)	Proportion
System Availability (GE-1)	Proportion
Center Speed of Answer (GE-2)	Mean
Call Abandonment Rate (GE-3)	Proportion
Mean Time to Deliver Usage Records (BI-1)	Mean
Mean Time to Deliver Invoices (BI-2)	Mean
Percent Invoice Accuracy (BI-3)	Proportion
Percent Usage Accuracy (BI-4)	Proportion
OS/DA Speed of Answer (OS/DA-1)	Mean
Network Performance (NP-1)	Mean, Proportion
Availability of Network Elements (IUE-1)	Mean, Proportion
Performance of Network Elements (IUE-2)	Mean, Proportion

### ***Test for Parity in Means***

Several of the measurements in the LCUG SQM document are averages (*i.e.*, means) of certain process results. The statistical procedure for testing for parity in ILEC and CLEC means is described below:

1. Calculate for each sample the number of measurements ( $n_{ILEC}$  and  $n_{CLEC}$ ), the sample means ( $\bar{x}_{ILEC}$  and  $\bar{x}_{CLEC}$ ), and the sample standard deviations ( $\sigma_{ILEC}$  and  $\sigma_{CLEC}$ ).
2. Calculate the difference between the two sample means; if *larger* CLEC mean indicates possible violation of parity, use  $DIFF = \bar{x}_{CLEC} - \bar{x}_{ILEC}$ , otherwise reverse the order of the CLEC mean and the ILEC mean.
3. To determine a suitable scale on which to measure this difference, we use an estimate of the population variance based on the ILEC sample, adjusted for the sized of the two samples: this gives the standard error of the difference between the means as

$$\sigma_{DIFF} = \sqrt{\sigma_{ILEC}^2 \left[ \frac{1}{n_{CLEC}} + \frac{1}{n_{ILEC}} \right]}$$

4. Compute the test statistic

$$z = \frac{DIFF}{\sigma_{DIFF}}$$

5. Determine a critical value  $c$  so that the type one error is suitably small.
6. Declare the means to be in violation of parity if  $z > c$ .

### **Example**

c: 3.58		Critical value for the test					
ILEC			CLEC			Test	
n	mean	variance	n	mean	variance	z	Violation
250	4.038	1.9547	50	5.154	23.2035	5.15	YES!

### Test for Parity in Proportions

Several of the measurements in the LCUG SQM document are proportions derived from certain counts. The statistical procedure for testing for parity in ILEC and CLEC proportions is described below. It is the same as that for means, except that we do not need to estimate the ILEC variance separately.

1. Calculate for each sample sample sizes ( $n_{ILEC}$  and  $n_{CLEC}$ ), and the sample proportions ( $p_{ILEC}$  and  $p_{CLEC}$ ).
2. Calculate the difference between the two sample means; if *larger* CLEC proportion indicates worse performance, use  $DIFF = p_{CLEC} - p_{ILEC}$ , otherwise reverse the order of the ILEC and CLEC proportions.
3. Calculate an estimate of the *standard error for the difference* in the two proportions according to the formula

$$\sigma_{DIFF} = \sqrt{p_{ILEC}(1 - p_{ILEC}) \left[ \frac{1}{n_{CLEC}} + \frac{1}{n_{ILEC}} \right]}$$

4. Hence compute the test statistic

$$z = \frac{DIFF}{\sigma_{DIFF}}$$

5. Determine a critical value  $c$  so that the type one error is suitably small.
6. Declare the means to be in violation of parity if  $z > c$ .

### Example

Example

c:	3.58	Critical value for the test
----	------	-----------------------------

ILEC			CLEC			Test	
num	den	p	num	den	p	z	Violation
5	250	2.00%	7	40	17.50%	6.50	YES!

### Test for Parity in Rates

A rate is a ratio of two counts,  $num/denom$ . An example of this is the trouble rate experience for POTS. The procedure for analyzing measurements results that are rates is very similar to that for proportions.

1. Calculate the numerator and the denominator counts for both ILEC and CLEC, and hence the two rates  $r_{ILEC} = num_{ILEC}/denom_{ILEC}$  and  $r_{CLEC} = num_{CLEC}/denom_{CLEC}$ .
2. Calculate the difference between the two sample rates; if *larger* CLEC rate indicates worse performance, use  $DIFF = r_{CLEC} - r_{ILEC}$ , otherwise take the negative of this.
3. Calculate an estimate of the *standard error for the difference* in the two rates according to the formula

$$\sigma_{DIFF} = \sqrt{r_{ILEC} \left[ \frac{1}{denom_{CLEC}} + \frac{1}{denom_{ILEC}} \right]}$$

4. Compute the test statistic

$$z = \frac{DIFF}{\sigma_{DIFF}}$$

5. Determine a critical value  $c$  so that the type one error is suitably small.
6. Declare the means to be in violation of parity if  $z > c$ .

#### Example

c:		3.58	Critical value for the test				
ILEC			CLEC			Test	
num	den	rate	num	den	rate	z	Violation
250	610	0.409836	34	30	1.133333	6.04	YES!